HELSINKI SCHOOL OF ECONOMICS (HSE)
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ON THE CAUSES OF SLOW GROWTH IN SUB-SAHARAN AFRICA

Why economic growth in sub-Saharan Africa has lagged behind the rest of the world and how to achieve sustained strong growth in the future

Economics
Master's Thesis
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Spring 2008

Approved by the head of the department of Economics 10/6 2008

and awarded the grade good, 70p.

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ABSTRACT

18.05.2008

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Why economic growth in sub-Saharan Africa has lagged behind the rest of the world and how to achieve sustained strong growth in the future

The slow and erratic economic growth of sub-Saharan Africa (SSA) has caused the region to fall further and further behind the rest of the world in material standards of living. This paper reviews and synthesizes the debate on why SSA is growing slower than other regions and what should be done to amend the situation, paying special attention to the possibility of determining the relative importance of the plethora of factors underlying economic growth in each specific case.

The paper begins by reviewing the theories and central methodologies used in growth literature. It will then go on to discuss the proximate causes of growth. The final part of the paper introduces the idea of second best effects from reform, and growth diagnostics as a potential tool to understand reform and policy priorities.

The main finding of the study is that there is now overarching panacea, a magic set of simple rules to follow. The same policies will succeed in some cases, fail or even cause harm in others. There is a generally agreed set of proximate causes of growth, but giving a long laundry list of items to fix at once is generally not helpful for countries with multiple problems and limited political capital. By focusing on the most binding constraint at a time we're likely to achieve the highest impact and limit the chances of detrimental second best effects leading to loss of welfare.

The recent pick-up in growth rates on the continent gives hope of a better future for the average African. However, continued efforts are required to further accelerate and sustain the growth in order to eradicate poverty and reach other Millennium Development Goals (MDGs). Drawing from the experiences of other countries that have faced similar challenges to establish general strategic direction may be helpful, but careful analysis of the local conditions is always required to establish the correct priorities.

Keywords: Africa, economic growth, growth diagnostics, poverty, Millennium Development Goals (MDGs)

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18.05.2008

SAHARAN ETELÄPUOLISEN AFRIKAN TALOUSKASVUN HITAUDEN SYYT

Miksi Saharan eteläpuolisen Afrikan talouskasvu on ollut hitaampaa kuin muualla maailmassa ja kuinka saavuttaa pysyvästi vahva kasvu tulevaisuudessa

Saharan eteläpuolinen Afrikan elintaso on jäänyt aina vain jälkeen muusta maailmasta johtuen alueen hitaasta ja epätasaisesta talouskasvusta. Tämä tutkimus käy lävitse keskustelua siitä, miksi Afrikan talouskasvu on ollut hitaampaa kuin muualla ja mitä on tehtävissä tilanteen parantamiseksi, kiinnittäen erityisesti huomiota mahdollisuuksiin määrittää talouskasvuun vaikuttavien tekijöiden keskinäinen tärkeysjärjestys kussakin erityistapauksessa.

Tutkimus alkaa kasvukirjallisuudessa käytettyjen teorioiden ja keskeisten metodien läpikäynnillä ja jatkuu keskustelulla talouskasvua yleisesti määrittävistä tekijöistä (proximate causes). Lopuksi tutkin mitä tapahtuu mikäli oletetaan että vain yhtä ongelmaa korjataan kerrallaan, kun useammilla kuin yksillä markkinoilla vallitsee ei-pareto-optimaalinen tilanne (second best effects), sekä tarkastelen kasvudiagnostiikkaa mahdollisena apuvälineenä reformi- ja toimintamenetelmäprioriteettien (policy priorities) määrittämisessä.

Mitään ihmelääkettä hitaan talouskasvun parantamiselle ei voida määritellä. Samat ohjeistukset tuottavat toisinaan hyvän tuloksen, toisinaan niillä ei ole mitään vaikutusta tai vaikutus on jopa negatiivinen. On löydettävissä tiettyjä yleisperiaatteita, joiden voidaan yksimielisesti sanoa olevan kasvua edistäviä. Ei kuitenkaan ole käytännössä mahdollista muuttaa kaikkea kerralla, etenkään kehitysmaissa, joissa reformoitavia kohteita on useita ja poliittinen pääoma (political capital) rajoittunut. Keskittymällä aina tiukimman pullonkaulan (the most binding constraint) avaamiseen voidaan saavuttaa suurin positiivinen vaikutus sekä välttää se, että toissijaiset efektit kääntäisivät reformin kokonaisvaikutuksen hyvinvointia alentavaksi.

Viime vuosien nopeutunut talouskasvu antaa toivoa keskivertoafrikkalaisen paremmalle tulevaisuudelle. Tarvitaan kuitenkin edelleen lisää työtä, jotta kasvu saadaan pysyvästi nopeammalle tasolle ja köyhyyden poistaminen ja vuosituhattavoitteiden saavuttaminen mahdollistuvat. Yksittäisten maiden ongelmia tarkastellessa on hyödyllistä oppia samanlaisia haasteita kohdanneiden maiden kokemuksista, mutta tarkka paikallisten erityispiirteiden ja haasteiden analysointi on aina tarpeen oikeiden prioriteettien löytämiseksi.

Avainsanat: Afrikka, talouskasvu, kasvudiagnostiikka, köyhyys, vuosituhattavoitteet

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1 The African Growth Tragedy

Slow growth in sub-Saharan Africa (SSA) and the subsequently persistent widespread poverty on the continent has been a central problem in development economics for decades. Despite much research there is little agreement on the exact reasons underlying the disappointing growth performance. Hence there is also a plethora of proposed solutions that have met with varied success. Little can be said with certainty; the same policies seem to sometimes work, other times have weak, unintended or outright negative effect effects.

This study critically reviews the discussion on the problem of economic growth in sub-Saharan Africa. The main research question is:

Why has growth in sub-Saharan Africa been so slow and how can we find the right policies to reverse the trend?

Supporting questions that clarify the problem are:

- What in the experience of SSA sets the region apart from others?
- Based on growth theory and findings from empirical studies, what are the possible factors behind the slow growth?
- Can we identify a more pragmatic approach to reform by searching for the binding constraints on growth in SSA?
- What can we learn from the pick-up in growth rates over the past few years?

The methodology of this paper is literature review. In exploring the different schools of thought and development of the thinking on reasons behind the laggard growth in SSA I seek to provide a comprehensive overview on the main lines of debate and the current understanding on the issue. The latter part of the study focuses on one influential paper called "Growth Diagnostics" (Hausmann, Rodrik and Velasco 2005) that aims to provide an intellectual framework for organizing analysis in a way that helps policy makers identify the most binding constraints to

growth and subsequently recommend policy action in situations of imperfect knowledge, second best effects and limited capabilities.

In this introductory chapter I review the growth record of SSA since the 1960s, briefly discuss the interplay of economic growth, development and poverty reduction, as well as the difference between long-run growth and growth episodes. The structure of the rest of the paper is as follows: Chapter 2 gives a short overview of the growth theory and main empirical methodology relevant to the literature. Chapter 3 introduces the debate over reasons behind the sluggish growth rates in SSA. Chapter 4 explains and evaluates Growth Diagnostics as a relatively recent tool for identifying priorities and policy recommendations in the jungle of possible solutions. Finally, Chapter 5 provides concluding remarks.

1.1 The track record of growth in sub-Saharan Africa

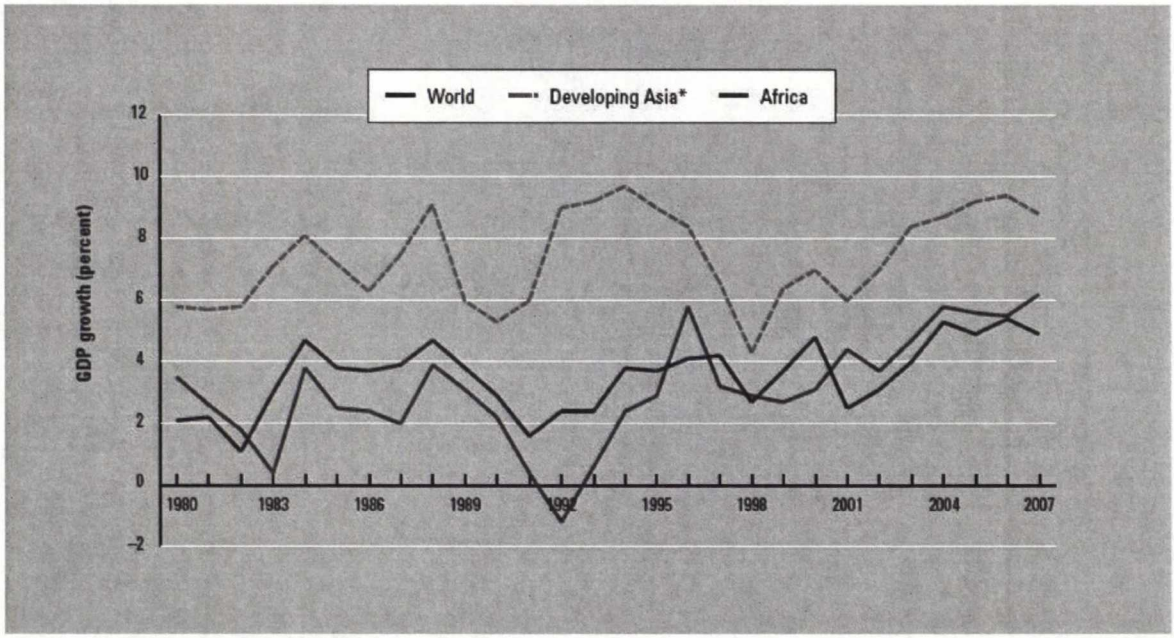
While the whole African continent has suffered from low growth, the story of sub-Saharan Africa (SSA) is especially tragic. In the 1950s and 1960s, optimism about the economic development of SSA prevailed. The natural resources, extensive land and huge peasant populations seemed to promise rapid industrialization and healthy growth. The two world wars had barely scratched the region, destructive civil wars had not been common and newly found independence generated a general feeling of optimism. (Freeman and Lindauer 1999)

However, since gaining independence – roughly from the 1960s onwards in most cases – the nations of SSA suffered from growth rates that are best described as dismal. Per capita income[1] growth averaged 1.5% in the early years of the independence in 1960s, and 0.8% in the 1970s. In most SSA countries the oil crisis marked a turning point from bad to worse: after 1974 average growth rates have been mostly negative. Bloom and Sachs (1998) note that during the decade 1985 to 1996 21 out of 42 sub-Saharan African countries for which data is available experienced negative per capita growth. Average growth in the 1980s was a catastrophic –1.2%. Output per

[1] Population weighted averages of PPP-adjusted per capita income. Penn World tables Version 6.2.

capita continued to decline from 1990 to 1996 at an annual rate of –0.9%[2]. (Bloom and Sachs 1998)

Even when the growth in the region has been positive, the growth rates have been lagging behind those of other regions (Figure 1). Poor already at the outset, SSA has increasingly been left behind compared to the rest of the world, which during the same period (from 1960 to present) has been growing on average at close to 2% annually. Compared to the average of developing countries, SSA fell some 1.5 percentage points short at the annual level of per capita income growth while the difference to the high performing Asian economies was about 3 percentage points (O'Connell and Ndulu 2000). In conclusion, the region is not catching up – it is falling further behind. (see for example Artadi and Sala-i-Martin 2003)



*Developing Asia comprises Bangladesh, Bhutan, China, Fiji, India, Indonesia, Kiribati, Lao People's Democratic Republic, Malaysia, Maldives, Myanmar, Nepal, Pakistan, Papua New Guinea, Philippines, Samoa, Solomon Islands, Sri Lanka, Thailand, Tonga, Vanuatu and Vietnam

Figure 1: **Africa's Comparative Growth Performance 1987-2007.**
Blanke (2007, 4)

Such differences in growth rates over sustained periods amount to huge differences in material well being: Africa's income per capita in 1992 was roughly the same as that of Western Europe

[2] Original source: World Bank's *World Development Indicators 1998.*

in 1820[3]. The GDP per capita in present-day SSA is barely higher than it was in 1960 – in 2003, the level of GDP in SSA was actually 11% (200 USD) lower than in 1974 (Artadi and Sala-i-Martin 2003, 2). While many countries had periods of rapid growth it was typically short-lived. In 1960-2003 only five countries in SSA (Botswana, Equatorial Guinea, Mauritius, the Gambia and Swaziland) reached average growth rates of over 5 percent (Carey, Gupta and Pattillo 2005).

On the continent as a whole the growth experiences have been diverse, although there are some commonalities between all countries. The majority of the countries has followed the typical path of slow growth in the early years of independence, decline between 1974 and 1994 and improved success after 1995. A few of them have faced long-term stagnation and decline. Some, typically in the Northern part of the continent, have reached consistent long-term growth. (Ndulu et al 2007) As a result, SSA is notably poorer that Northern Africa. In 1995 the five North African countries had an average income of 4371 USD (PPP adjusted 1991 dollars), while the comparable figure for SSA was only 1732 USD.

	2003	2004	2005	2006	2007 estimate	2008 estimate
Real GDP	4.3	6.2	6.1	5.5	6.2	6.9
of oil exporters	7.4	8.4	7.7	5.7	7.6	10.6
of non-oil exporters	3.3	5.4	5.2	5.4	5.4	5.4
Per capita GDP	2.3	4.2	4.2	3.5	4.2	4.9

Table 1: **Growth rates in sub-Saharan Africa 2003-2008.**
IMF (2007, 3)

Interestingly, in the past few years growth in SSA has picked up considerably and has even surpassed the world average, though still significantly below that of the developing Asian economies (Figure 1). Per capita growth reached 4.2% in 2004 and 2005 and is projected at 4.9% in 2008. While oil-exporting countries are growing a lot faster than non-oil exporters (Table 1), the latter are also gaining significant momentum versus the past. Meanwhile inflation has

[3] Measured in common purchasing power 1990 international dollars the exact figure were 1284$ for Africa in 1992, and 1292$ for Europe in 1820 (Bloom and Sachs 1998, 2).

generally been kept at bay with an average of 7.5% in 2007 and 32 out of 44 countries in single digits. A notable exception is Zimbabwe that still suffers from hyperinflation combined with a declining economy. (IMF 2007) It is interesting to explore what factors could be behind the positive change and whether the growth will be sustainable.

1.2 Growth, Development and Poverty in sub-Saharan Africa

Development as a concept is difficult to define, and value judgments would inevitably have to be made to come up with any kind of definition at all. The development of a human society need not equal progress toward a western standard; it need not entail liberal democracy and free markets, for example. It is not within the scope of this study to pass such value judgments – as a study in economics this paper focuses on *economic* development, defined as the increase of material well being in per capita terms.

The view taken in this study is that to find a way out of their current state of dependency and to truly have the freedom to choose their own preferred paths, the Sub-Saharan countries necessarily need economic growth. The overarching goal of development is to provide people with the means and ability to lead the kind of life they value. While GDP-levels naturally do not give the whole picture of a country's state of development, such abysmal growth as SSA has experienced these past decades precludes meaningful progress in other areas. Without economic growth the poor countries of SSA will continue to depend on foreign aid and borrowing to fund even such basic services as education and health care, unable to develop a sustainable infrastructure and break free from over-indebtedness.

Growth is not the same as poverty reduction. For economic growth to be translated into poverty reduction, other factors such as income distribution and control of corruption are crucial. Income inequality in SSA is large compared to other regions and there is evidence that discrepancies have grown wider over time. Artadi and Sala-i-Martin (2003) report an increase in the Gini coefficient from 0.58 in 1970 to 0.65 in 2000. In 2000, almost half of the continent's population lived in

extreme poverty, compared to 36% in 1970 (Ndulu et al 2007). Moreover, most of the inequality can be accounted for by inequality *within* countries rather than between them. Part of the rise in inequality does come from some countries outperforming the others, but the majority is due to changes in income distributions within countries. Artadi and Sala-i-Martin note that the incomes of the richest have not declined and in some countries have actually gone up – therefore it is the very poorest that have suffered the most and whose income has gone down the most. The proportion of people living in absolute poverty[4] in the region has risen from 48% in 1970 to 60% in 2000. Over the same period, worldwide inequalities have been decreasing and poverty ratios fell from 37% to 16%.

However, without the growth there is not much to be divided. While growth alone is not sufficient for poverty reduction and other problems need to be attended to as well, SSA needs growth to stop poverty from expanding. Carey, Gupta and Pattillo (2006) estimate that most SSA countries would need to double their growth rates to reach the Millennium Development Goal of halving the 1990 level of poverty by 2015.

1.3 Steady-State Growth vs. Growth Episodes

Hausmann, Pritchett and Rodrik (2004) note that the growth rates of individual countries tend to be enormously unstable and volatile while nearly all of the empirical determinants of growth tend to be quite stable.

The same assumptions used in the study of industrialized countries may not be directly applicable to the study of economic growth in developing countries. Pritchett (1998) suggests that the use of "panel data" to examine long-term growth in developing countries may be useless, because

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[4] Artadi and Sala-i-Martin (2003) use the following definition for absolute poverty: The original World Bank definition of 1 USD in 1985 dollars adjusted to 1996 dollars to match the data used in their study. Following Surgit Bhalla's 2002 study *Imagine there is No Country: Poverty, Inequality and Growth in the Era of Globalization* (Institute for International Economics Editor, Washington DC) they add a further 15% to account for the fact that richer citizens tend to underreport their income proportionally more than poorer citizens, arriving at a total of 570 USD per year.

volatility is much greater than in a typical developed country and the patterns of growth very varied. Whereas the graphical presentation of growth in a typical "Western" economy would be one of a "modestly sloping, only slightly bumpy hill" - reasonably stable exponential growth with modest cyclical deviation – developing countries show several different patterns. These include growth followed by stagnation, rapid growth followed by declines, catastrophic declines, continuous stagnation, steady decline, and steady growth. It is therefore especially interesting in the context of developing countries to investigate what initiates or halts episodes of growth rather than focusing on the long-term determinants alone.

The higher growth rates of the recent years give a glimmer of hope to the populations of SSA. However, unless the growth is further accelerated and sustained, especially in the most populous countries of the continent (Sudan, the Democratic Republic of Congo, Nigeria and Ethiopia), it will not be enough to make a substantial difference to the living standards of the average African. Therefore policies should focus on doing the right thing for the long run over fast wins in the short term.

2 Theory and Empirics of Growth

2.1 Theories of Growth

The neoclassical growth model of Solow (1956) has been and still is one of the most influential theoretical bases for growth strategies. Solow emphasizes the importance of savings and capital formation for economic development and growth. Countries that experience per capita growth have increasing capital-labor ratios, which in turn result from high enough savings rate to compensate for capital depreciation and population growth.

The model allows for changes in wage and interest rates, substitutions of labor and capital for each other, variable factor proportions, and flexible factor prices. The production function is of Cobb-Douglas -type:

$$Y = AK^{\alpha}L^{\beta} \qquad (1)$$

Where Y is output or income, A the level of technology, K capital, L labor and α and β the elasticities of Y with respect to K and L respectively. It is assumed that $\alpha+\beta = 1$, so we have constant returns to scale. With perfect competition α and β also represent the income shares of capital and labor. As $\alpha < 1$ and $\beta < 1$ we have diminishing returns to both labor and capital. Due to diminishing returns to capital the model implies convergence in income levels. Per capita growth rate inversely related to its starting per capita income level; as a consequence *there should be convergence in income levels over time.*

The growth-rate of output per worker g_y, depends on the rate of convergence α, $0 < \alpha < 1$, the steady-state level of income y^*, and the current income per worker y_t:

$$g_y = \alpha\,(y^* - y_t) \qquad (2)$$

The steady-state y^* depends on a number of factors, total factor productivity (TFP) being the major one. This is also known as the Solow residual, or the part of growth that cannot be explained through capital accumulation. It is most often thought of as technological change, but can also encompass the role of externalities, changes in the sector composition of production or the adoption of lower cost production methods. (Easterly and Levine 2002)

Long-term growth in the model is thus determined by an exogenous variable. Without continuing technological advancement per capita growth eventually ceases as the steady-state level of income is achieved. The obvious drawback of this is that the model excludes the very variable that would explain long-run per capita growth. Another factor that explains the levels of income in the long-run, population growth is also external to the model. Thus the neoclassical model, despite its merits as a model for the short-run, fares poorly as an explanation of long-run determinants of growth.

The original Solow model has subsequently been augmented by factoring in human capital. (See for example Mankiw, Romer and Weil 1992, Lucas 1988, Caballe and Santos 1993, and Barro and Sala-i-Martin 1995) Main components of human capital are education and health. The economy tends toward a steady-state ratio of physical to human capital, but the ratio need not equal the long-run value initially. Human capital is endogenous to the model: economies acquire more human capital as they grow. Empirical work typically uses values at the beginning of the analyzed period. Another later addition is the effect of political variables, which will be discussed at length later.

Neoclassical theory suggests the low growth of SSA is due to low levels of the steady-state per capita output, y^*, as growth rates closer to the steady-state income level would be lower than if the current income level was far below the steady-state. Explanations as to why the steady-state income levels would be so far below those of the rich countries could be found in a number of environmental and policy variables. In the private sector the relevant variables would include saving rates, labor supply, and fertility rates – all depending on preferences and cost, amounting to incentives. Governmental factors such as public spending, taxation, market distortions, and institutions (rule of law, property rights, political freedom) would also likely play a part. As

African countries are typically not powerful in economic terms, external factors such as terms of trade can also have a significant impact.

The convergence in the model is c*onditional*. Barro (1997) argues that generally speaking poorer countries grow faster per capita once measures of government policy, initial levels of human capital, and so on are held constant. However, once again Africa seems to be an exception (Barro 1991). The Solow growth model fails to fully explain African growth, leaving the a major part of the puzzle on variables exogenous to the model: why has SSA grown slower than it should have, given the levels of endogenous factors in the model? The so called "Africa or Tropics Dummy", unexplained part of poor African performance in growth regression studies, will be discussed at length below.

Endogenous growth theory has sought to provide the explanation of long-run growth missing in the neoclassical theory. This is difficult to do in the neoclassical framework, because standard competitive assumptions cannot be maintained (Barro 1997).

From the 1980's researchers have pointed out that the Solow model does not allow for a realistic model of technological change. Returns to capital do not necessarily diminish as economies develop. Spillovers of knowledge across producers and externalities from human capital help to diminish the effect of diminishing returns. Learning by doing, and ideas arising as by-products of production or investment increase the total factor productivity and may even lead to increasing returns over time (Sheshinski 1967). Including assumptions on diffusion of technology between interrelated economies make also these models predict convergence. (See for example Romer 1986, Lucas 1988, Rebelo 1992). Whereas in neoclassical growth theory technological change is the primary determinant of long-run steady-state growth, endogenous growth theories often incorporate a role for physical and human capital in determining the steady-state growth and argue that differences in technology contribute to variations in the *speed* of convergence (Bosworth and Collins 2003).

Technological advance results from purposive R&D activities and is rewarded by some form of ex post monopoly power. Due to distortions related to methods of production and the creation of

the new goods the rate of growth and the underlying amount of inventive activity tend not to be Pareto optimal. The long-term growth rate depends on governmental actions, such as taxation, maintenance of law and order, quality of infrastructure services, protection of intellectual property rights, and regulation of international trade, financial markets, and other aspects of the economy. (See for example Romer 1986, Aghion and Howitt 1992, Barro and Sala-i-Martin 1995)

Despite its shortcomings, neoclassical theory – augmented to include government policies, human capital and other relevant factor – remains a valid base for cross-country comparisons of relative rates of growth and is, in its many slight variations, the main theoretical background in majority of the empirical work.

2.2 Growth Accounting and Growth Regressions

Early research in the post-war period concentrated on growth accounting, the breaking down of economic growth into components to understand the relative importance of changes in factor inputs (factor accumulation) and technological change (or total factor productivity, reflected in the Solow residual) for explaining growth trends. It should be noted that growth accounting alone cannot and is not intended to determine the *fundamental* causes of growth. It will not be possible to say whether increased capital accumulation promoted growth by making additional innovation possible, or if the reverse causality holds true and productivity growth caused the capital accumulation, e.g. by increasing the expected returns to investment. (Bosworth and Collins 2003) Barro (1999) explains that growth accounting is generally viewed as a preliminary step for the analysis of fundamental determinants of growth and is especially useful if the determinants of factor growth rates are substantially independent from those that matter for technological change.

Most of modern growth empirics concentrates on cross-country economic differences, employing statistical methods such as regressions. Typically the research questions fall under one or more of the three prominent problems, namely (a) convergence: are income differences permanent or

transient; (b) properties of the current cross-section income distribution and, most relevant to this study, (c) the identification of growth determinants, fundamental as opposed to proximate (Durlauf, Kourtellos and Tan 2005).

Empirical research based on the Solow growth model estimates an equation of growth of output using one or more of the following determinants (Bates and Nkurunziza 2003):

- Measures of the initial level of output and technology to capture initial conditions
- The (exogenous) rate of technical change, accounting for productivity changes
- The savings rate to account for capital accumulation
- The growth rate of the workforce
- The rate of depreciation of capital
- The share of capital in output
- The rate-of convergence to the steady-state, derived from a production function

Per capita growth rate of output, g, is determined by the function

$$g = f(y, y^*), \qquad (3)$$

Where y^* is the steady-state level of per capita output. Dy is diminishing in y given y^*, and increasing in y^* given y. (see for example Barro 1997, 8). In cross-section regressions (see for example Barro 1991, Levine and Renelt 1992, Hoeffler 2000)

$$g_i = \alpha + \beta y_i + \gamma x_i + u_i, \qquad (4)$$

where g_i denotes the growth rate of real GDP per worker averaged over a 20 to 30 year period, y_i the initial level or real GDP per worker, $i = (1, \ldots, N)$ denotes a country index, and u_i is an error term. There is some theoretical support for using cross-sectional averages for panel data analysis ("average" slope coefficients), but as case studies have shown, the approach also has its shortcomings. Averaging data over long periods wastes valuable information on the dynamics of growth, a phenomenon which by definition is dynamic. Using cross-section equations also risks omitting a variable due to heterogeneity of the studied countries. Also, some variable explaining

growth, notably investment, will more likely be endogenous. It should be noted though that the problem of endogeneity is not particular to dynamic panel models. (Bates and Nkurunziza 2003).

The usefulness of growth regressions has also been called to question on the grounds of instability of the resulting parameter estimates (See for example Levine and Renelt 1992, Lindauer and Pritchett 2002). However, most of the variability can be explained by variation in the sample of countries, the time period and the additional explanatory variables included in the regression (Bosworth and Collins 2003). This reinforces the point that regressions have their limitations in explaining country-specific factors but they do still serve an important role in testing the importance of core explanatory variables in general.

An important claim from growth accounting literature is that total factor productivity produces the bulk of cross-country variation in income levels. Klenow and Rodriguez-Clare (1997) calculate that only approximately half of the cross-country variation in income in 1985, and 10% of the difference in growth rates from 1960 to 1985, is explained by variation in human and physical capital inputs. Also Easterly and Levine (2002) find that differences in inputs do not account for satisfactorily differences in outputs. Caselli (2005) confirms that this finding is robust even against several checks including improving the measure of human capital with allowances for educational attainment and health status of the population, sectorial disaggregation of the output, attempts to account for the age composition of the capital stock and several others. TFP is the major explanatory factor, accounting for at least 50% of the observed growth rate differences. However, as the knowledge about certain key parameters that describe the relationship between outputs and inputs – and the means at hand to measure them – remain incomplete, it should not be concluded factor accumulation does not play a central role alongside TFP. Caselli points out the elasticity of substitution between different types of capital as one key area for future research. The differences in the composition of capital stock (human vs physical capital) are pronounced between rich and poor countries, and, depending on the elasticity could explain much of the income difference.

Bosworth and Collins (2003) note that the way growth accounting measures TFP is inherently problematic. As TFP is a residual providing a measure of gains in economic efficiency (quantity

of output that can be produced by a given quantity of inputs), it can be thought to shift the production function. However, there can be a host of other determinants besides technological innovation causing such a shift, that were not captured by the measured increase in factor inputs, such as political turmoil, external shocks, government policy changes, institutional changes and errors in measurement. Therefore the residual does not necessarily reflect technical change accurately.

2.3. The African Dummy

Researchers have frequently found what is called the African Dummy - the discrepancy between the observed and expected growth rates of African economies in cross-country or panel growth regressions. For example in his seminal study of economic growth in a cross-section of countries Barro (1991) found that the unexplained part of the growth performance of African countries in the period 1960-1985 remains at about one percentage point even holding human capital and investment ratio constant.

Early studies in the endogenous growth literature found that a significant African dummy still remained and much of the subsequent research has focused on eliminating the dummy. Africa's slow growth would be "explained" if it is fully accounted for by differences between Africa and other regions in the standard explanatory variables (Collier and Gunning 1999). Collier and Gunning find the African dummy significant when interacted with some of the explanatory variables; interactions with other variables are insignificant.

The African dummy can be seen as a specification or an estimation problem (Bates and Nkurunziza 2003). If the problem is one of specification, re-specifying the growth model by adding variables potentially capturing factors missing in the original Solow model should reduce the dummy. Some studies endogenize the savings variable by including the policy variables influencing savings, such as the black market premium and the rate of inflation. Sociological and political variables such as ethno-religious fractionalization have also been added. (See for

example Easterly and Levine 1997, Barro and Lee 1993, and Alesina, Ozler, Roubin and Swagel 1996)

The other possible source of error is faulty methods of estimation. Hoeffler (2000) argues that cross section OLS and fixed effect panel approaches to estimating the growth model employed in most studies are flawed methods because they are easily biased by unobserved country specific effects and the endogeneity of investment in estimating the parameters of the model. Hoeffler recommends using a recently developed system generalized method of moments (GMM) for panel growth regressions.

The GMM methodology addresses the bias problem in single cross-section regressions through the use of a dynamic panel data model. This allows for the inclusion of the above-mentioned country specific effects – different factors at force or having differing effects – as well as the endogeneity of one or more of the regressors. Single cross-section growth regressions do not, for example, allow for differences in the initial level of technology between the countries, so the error term is likely to contain unobserved country-specific effects due to these differences, which in turn are likely to be correlated with some of the other, observed regressors, in particular with the initial level of GDP. Hoeffler finds that when using the appropriate method, the African dummy is insignificant even in the context of the basic Solow model with no additional variables.

Most studies explain only a small proportion of the variation in growth rates – Hoeffler (2000) claims this cannot be otherwise since growth has determinants peculiar to the country or region studied. There is significant evidence of nonlinearity and parameter heterogeneity in the way these factors enter into growth regressions (Durlauf, Kourtellos and Tan 2005). Especially in cases where the local conditions differ significantly from what is considered standard in the developed world, the importance of case studies to understand the local peculiarities is amplified.

The slow growth is thus partially explained by variables globally important for economic growth, but that are lower in Africa than elsewhere. Part of the slow growth can be explained by a different effect of certain variables in Africa. However, this merely shifts the focus of inquiry to

why some variables are low in the region and why others have a different effect than elsewhere in the world. (Collier and Gunning 1998)

3 The Debate on Growth in sub-Saharan Africa

Why are poor countries poor? And how to get them to prosper? The question of just how exactly economic growth can be achieved has been a central point of interest for academics and policy makers alike since the days of Adam Smith but no real agreement on the issue has been concluded.

Since the 1990s there has been a resurgence of interest in empirical work examining the determinants of growth rates and levels of income across countries. There is a vast literature on growth regressions, with cross section or panel data, and numerous papers have claimed to have found the variables that are best correlated with growth. An enormous array of country geographic, policy and institutional characteristics has been examined for association with growth rates. The number of these variables is in fact so high that it's hard to tell which ones are actually the robust ones, and even harder to translate the theory into feasible policy advice. If the answer to higher growth could be anything from human capital to R&D, any number of policy or financial variables, political instability, geographical factors, or the degree of openness, the usefulness of this information is very limited.

The key findings from these studies are as follows. While there is no simple determinant of growth, the initial level of income seems to be the most robust factor; again this finding is not a very significant point when making policy decisions in a developing country, as it needs to be taken as a given. The *size* of the government seems quite insignificant (although some studies, such as Barro and Lee 2003, do find negative correlation between overly large governments and growth), but the quality not – bad government is bad for the economy as it often causes hyperinflation, distortions in foreign exchange markets, inefficient bureaucracies etc. The relation between human capital and growth is weak: some measures of health e.g. life expectancy are robustly correlated with growth, but causality between the variables is arguable. Good institutions important, but it is easier to identify the key functions the institutions should provide than to pinpoint an exact ideal structure or form for them. More open economies generally grow faster. (Sala-i-Martin 2002, Doppelhofer et al 2004)

Lindauer and Pritchett (2002) divide the history of the "big ideas" on policies for economic growth into three time periods, with the broad, "common sense" arguments and subsequent consensuses on the basic policy advice of each era being highly different from the others, at times even in direct conflict. To an extent this reflects learning throughout the past decades as the flaws of the previous policies and the thinking behind them have come obvious, but it also reflects the difficulty of finding the magic recipe for something as elusive as economic growth.

Area	1960s	1980s
Government	Plays a central role; acts as a driving force behind development	Plays a central role, but acts as the main obstacle to development
Accumulation	Is central to development process; coordination and scale problems require government involvement	Is central to development process; private sector investment is the key
Trade and Integration	Has no particular advantage beyond the import of capital goods and the purchase of necessary inputs	Exports bring dynamic advantages; import competition is necessary for disciplining domestic producers
Foreign capital	FDI is to be avoided, but government borrowing is acceptable, preferably from foreign sources	Government borrowing is to be avoided, but FDI is encouraged
Development assistance and the role of the multilaterals (primarily IMF, the World Bank, and the IDB.	Provide project-based lending of investable foreign exchange and resources to governments	Quick disbursing; policy-based lending to establish conditions for FDI and domestic investment

Table 2: **The prominent ideas in the 1960s vs. 1980s.**
Lindauer and Pritchett (2002,10)

The current era, according to Lindauer and Pritchett, is characterized by the absence of great ideas. For each example of a policy that works there is a counterexample. This does not mean that anything goes and everything works – rather the opposite, so little seems to work. Countries continue to experience rapid growth bursts, but very few are capable of sustaining them over long periods of time.

3.1 Capital Accumulation and Total Factor Productivity

3.1.1 Physical Capital and Total Factor Productivity

Both the Solow-Swan model and new growth theories put physical capital accumulation in a central place in economic growth. This has long been mirrored in the policies of international development agencies, such as the World Bank, most notably in the calculation of "financing gaps". Economists would calculate the difference between the actual investment rate in a country (financed out of the country's own savings) and the investment rate needed to reach a specific growth target. Bridging the gap by bringing enough money into the country was supposed to result in the target rate of growth. Unfortunately this simple calculation turned out to be faulty. Simply pouring money did not make SSA grow.

Easterly (2001, 35) cites Guyana as an example of the failure in the approach. Total GDP of the country fell sharply from 1980 to 1990 while investment was increasing from 30 to 42 percent and foreign aid was 8 percent of the GDP annually. Generally he finds that of the 88 development aid recipient countries that data is available for in the period 1965 to 1995, only seventeen show a positive statistical association between aid and investment. Only six of these seventeen show domestic investment increasing (as would be expected if the aid is not crowding out domestic investment) at least in a ratio of one to one. He also finds on feeble links between investment levels and subsequent growth rates. (Easterly 2001, 37-39)

King and Levine (1994) also conclude that differences in capital per person explain little of the output per person differences across countries and growth in capital stocks account for little of the output growth. They find that ratio of investment to GDP correlates strongly with economic growth but suggest the causality may be reversed: economic growth allows higher investment and savings rather than the other way round. Capital accumulation should thus be seen as an integral part of the process of economic development but not as the igniting source of growth.

Other influential studies differ widely in their approximation of the relative importance of capital accumulation and TFP. Mankiw, Romer and Weil (1992) argue as much as 80 percent of the international variation is due to differences in physical and human capital, where as Klenow and Rodriguez-Clare (1997) claim that TFP accounts for 90% of the cross-national variation in growth rates. Bosworth and Collins (2003) find both capital accumulation and total factor productivity to have been equally important contributors to growth of output per worker. They also claim that the differences in the empirical results arise to a large extent from basic measurement issues: relying on investment shares to proxy for changes in the capital stock, some studies measuring investment stock in domestic and some in international prices, and some measuring the contribution of capital by the change in capital-output ratio instead of by the change in the capital-labor ratio.

However, countries where investment goods are expensive relative to consumption goods tend to have lower growth rates. Doppelhofer et al (2004) found that the price index for consumption goods were 120 in SSA, compared to 70 in OECD. Artadi and Sala-i-Martin (2003) estimate that growth in Africa would have been 0.44 percentage points higher if the price of investment had been at the same level as in the OECD.

Caselli and Feyrer (2007) explore the claim that capital accumulation in poor countries is hindered by friction in the international credit flows. Capital is efficiently allocated between countries if the marginal product of capital (MPK) is equalized. Caselli and Feyrer (2007) find that MPK is much higher on average in poor countries, but there is not much difference in financial rates of return from investing in physical capital. This suggests that the differences cannot be accounted for by international credit frictions. Caselli and Feyrer (2007) argue that the apparent differences in MPK are to an equal part driven by the relatively high cost of investment goods in developing countries and capital shares on the one hand and relative contributions of complementary factors on the other.

Caselli and Feyrer (2007) point out that physical MPK differences can be upheld even in the presence of perfectly unencumbered capital flows if we allow for multiple sectors of economy. If the relative price of investment goods (prices of output goods lower relative to capital) is higher

in poor countries, investors in physical capital there need to be compensated by higher physical MPK. Correcting for the differences in relative cost of capital diminishes the observed differences between countries significantly.

Also Hsieh and Klenow (2003) conclude that the robust relationship between real investment rates and real income is to a large extent driven by differences in the relative price of investment across countries. Investment rates are only moderately higher in rich countries compared to poor countries if measured at domestic prices. Poor countries have lower prices of consumption goods, driving the higher cost of investment in relative terms and hence lower investment rates.

Another driver is inaccuracies in the way capital share of income is typically calculated. The capital share of income is usually calculated as 1 minus the labor share. Especially in the case of many developing countries that have high proportion of land and other natural resources relative to capital accumulated through investment flows, this measure gives an inflated measure of the marginal productivity of reproducible capital as payments to all capital is included but capital stock is valuated excluding land and other natural resources. Caselli and Feyrer (2007) find that separating natural capital from reproducible capital in the calculations significantly reduces the gap between rich and poor countries – GDP loss due to MPK differences in poor countries is reduced to one-fifth vs. uncorrected estimates.

The remaining difference Caselli and Feyrer (2007) explain with lower endowments of complementary factors, such as human capital, and lower efficiency (TFP). These differences mean that the enormous differences is capital-labor ratios observed between countries may reconcile with equalized MPKs. Overall the finding that frictions in international capital movements do not explain lower investment levels in developing countries has the important implication that increased aid flows to developing countries would likely be counterbalanced by private investment flows to the opposite direction, resulting in no significant increase in income in these countries.

	Rich Countries	Poor Countries
naive estimate	11.4 (2.7)	27.2 (9.0)
after correction for natural capital	7.5 (1.7)	11.9 (6.9)
after correction for price differences	12.6 (2.5)	15.7 (5.5)
after both corrections	8.4 (1.9)	6.9 (3.7)

Rich (poor): GDP at least as large (smaller than) Portugal. Standard Deviations in parentheses

Table 3: **Average Return to Capital in Poor and Rich Countries.**
Caselli and Feyrer (2007)

Investment ratios in Africa have indeed been low and declining until recently. According to Artadi and Sala-i-Martin (2003) investment rates have always been below 15% and after the oil crisis declined to 7.5% in sub-Saharan Africa, whereas typical values in the OECD countries have ranged from 20% to 25. East Asian tigers have reached an average of 30%. On top of low overall rates of interests, Africa suffers from comparatively low ratios of private to public investment: the ratio was just over 2 in 1990s compared to the 6.6 OECD-average. Private investment is incentive-driven (rate of return) and therefore tends to be more efficient than public investment, where political motives often take precedence over economic ones. Public investment is important in areas where markets are likely to fail – for example in providing basic physical infrastructure – but more often than not public investment has been less efficient than private.

Bates and Nkurunziza (2003) cite the example of Burundi, where over 100 state firms were created between the late 1970s and 1980s. Most of these firms never became profitable, and have instead become a drain for taxpayers' money. Improvements in human capital through investment in health and education have been skewed towards the capital and the south of the country, the strongholds of the political elite, demonstrating that rent sharing has been the overriding concern in the allocation rather than economic and social efficiency.

Returns to investment in SSA are likely to be relatively high after reforms in 1990s. Collier and Patillo (2000) find evidence that return on FDI in Africa was higher in the latter part of 1990s than anywhere else. Private investment remained low despite: 10% of GDP compared to average of 18% in non-African developing countries. Survey evidence points to the direction that high

investment risk, especially the fear of political instability is a major cause. This effect is larger than in other regions, due to higher perceived risk. The region is risky even objectively speaking (historically unpredictable government policy and uncertain macroeconomic environment), but Africa may also be rated more risky than its underlying economic fundamentals would warrant. Empirical research on determinants of country risk rating has found an "African dummy" not explained by objective measures. (Collier and Patillo 2000,3-4)

Collier and Gunning (1998) argue that a hostile environment – particularly high risks – and inadequate social capital, dysfunctional government in particular, have lowered returns on investment causing capital flight on a massive scale. On a more positive note, social capital is now improving. Even if many African governments continue to be dysfunctional, some have now substantially liberalized controls and improved service provision. Democratization is both permitting these changes politically and allowing formerly repressed civic institutions to emerge, thus increasing social capital. The risks arising from government behaviour are starting to diminish.

The effects of these efforts are perhaps now beginning to bear fruit. Domestic investment – now close to 22% of GDP (IMF 2007, 4), well over the average of non-African developing countries – and productivity have risen and the region's growth rates are picking up as expected. This is likely to be in great part due to improved stability, both political and economic, as well as the many painful reforms the countries have seen through recent years.

Main criticism on capital fundamentalism has been that without adequate political and economic institution, added investment will not be effective. Problems of corruption, instability, and funds being diverted to wasteful projects stifle growth. There may also be more than one equilibria in development due to e.g. externalities of education and government policy (Stiglitz 2001, 21).

Although its role in promoting economic growth may be exaggerated, it would be hard to argue that capital accumulation, especially if understood in the general sense of both physical and human capital, wouldn't matter at all. Rather, the power of capital to promote growth is conditional on other factors; the extent to which the economy favors production instead of

diversion, and the stability of the economic environment. (See for example Bates and Nkurunziza 2003) Continuing the efforts to reduce transaction costs to private business (especially indirect costs related to poor infrastructure), support innovation and adaptation of new technologies, and improve institutional capabilities and transparency will raise the productivity of both new and existing capital and further attract investment onto the continent as well as increase the growth rates achievable with current levels of capital (See Ndulu et al 2007).

3.1.2. Human Capital

Although the worst of capital fundamentalism has long been discarded, it still lives on in the idea that increasing savings and investment, this time in human capital, will translate in to higher growth. Greater effort in education and health is expected to lead to a higher accumulation of human capital assets and hence to a higher level of income. (Hausmann, Rodrik and Velasco 2005, 20) Educational attainment can have an impact on economic growth in two different ways. Firstly, education may improve the productivity or quality of workers. Secondly, an educated workforce is better able to implement new technologies and to generate ideas for improving efficiency, hence feeding back to improvements in TFP. (Bosworth and Collins 2003)

Growth and schooling are highly correlated across countries (Barro 1991, Sala-i-Martin 1997). However, the significance of education in growth regressions tends to be ambiguous (Bloom and Sachs 1998, Barro 1997), and the causality between the two is not clear.

A large amount of microeconomic evidence exists to link education and earnings. However, empirical research has more often than not failed to establish the same link in a robust way on the macro level. Bils and Klenow (2000) find that countries with high enrollment rates in 1960 do exhibit higher growth rates in the period 1960-1990, but that the impact of schooling on growth explains less than one third of the empirical correlation between growth and schooling. The reverse channel (faster growth inducing more schooling by raising its effective return) can potentially explain more than half of the observed relationship. Also there may be other factors

correlated with both higher growth and high levels of schooling, for example better enforcement of property rights or greater openness.

Possibly the social return to education is much lower than the private return, explaining the wedge between the results of microanalysis and the aggregate macro data. If differences in educational attainment between individuals simply reflect the differences in their innate abilities, then the aggregate gains from education would be mostly limited to matching workers and jobs appropriately. However, if an educated workforce is more efficient and contributes to an accelerated pace of innovation, then the social gains could well be higher than the private. Bosworth and Collins (2003) find it puzzling that it is difficult to establish a positive association between growth and average years of schooling.

The nature of knowledge as an (impure) public good leads to under investment in the production and dissemination of knowledge - investment in education and R&D remain at socially sub-optimal levels without intervention by a public authority. Development of human capital in SSA has also been lagging behind that of other regions. Primary School Enrollment, an often-used indicator of education levels, was only 40% in 1960 in sub-Saharan Africa 40%, compared to nearly 100% in OECD and East Asia. (Doppelhofer, Miller and Sala-i-Martin 2004) Had the enrollment been at OECD levels, GDP per capita growth would have been 1.47 percentage points higher. (Artadi and Sala-i-Martin 2003) The drastic improvement in school enrollments as a result of efforts by both the governments and by aid agencies should give brighter prospects to growth in the area in the future. However, Freeman and Lindauer (1999) note that many developing nations have progressed with limited investments in schooling, arguing stress on investment in education as a prerequisite for rapid growth is misplaced. Also Easterly (2001) argues that the focus of governments and international agencies alike on raising levels of literacy and educational attainment has been misplaced.

The real reason for the lack of correlation between schooling and growth may be accountable to measurement error. An abstract concept such as human capital cannot be directly measured and the data available is very noisy (variations in the classification of educational attainment over time, availability of age-specific data etc) and possibly not the right indicator. Measuring cross-

national variations in educational attainment purely in terms of years of schooling may also fail to account for variations in the *quality* of education. One year of schooling in one country is not necessarily worth the same as one year of schooling in another (Bosworth and Collins 2003).

It is not easy to establish reliable measures for the quality of education. Caselli (2005) reviews some of the suggestions. One intuitive proposition is that the effect of educational level of the previous generation ("teachers") may influence the human capital of the next generation. However, the educational attainment of the teachers is not found to have a measurable impact on schooling outcomes, though this only means that it is not possible to establish a qualified measure of teachers' credentials from the available data - mainly years of schooling in the previous generation. Also the effect of parental education on wages is found to be insignificant.

Other measures of the quality of schooling include teacher-pupil ratios (if average classroom sizes are smaller, a single student is likely to receive more individual attention) and government spending on education (roughly reflecting variation in materials available and teacher-pupil ratios as well as possibly quality of teachers), both of which Caselli founds to be of barely sufficient explanatory power (<0.50). Plotting official test scores as a proxy for educational quality against growth rates shows correlation so that rich countries generally perform better, but the sample size is too small to conclude anything decisive. Experience levels actually appear to have a negative correlation to wage levels. This observation, though at first counterintuitive, is easily explained; workers in richer countries tend to spend longer at school before starting the working life so poor countries have less education but more experience.

Public health concerns – malaria, HIV/AIDS, tuberculosis (TB), childhood infectious diseases, maternal and perinatal conditions, malnutrition and tobacco-related illnesses – are one of the central challenges Africa faces. Life expectancy for the whole of African continent in 1960 was just over 40 years, comparing very unfavorably to 67 years in OECD countries. Infant mortality rate in 1995-2000 was 92 deaths per 1000 live births in SSA compared to 6 in high-income countries. Notwithstanding the human suffering and premature deaths in the affected population, an important consideration is the association between poor health and low growth. Improving health in developing countries is not only a fundamental goal of economic development, but also

a means to achieving other developmental goals relating to poverty reduction. There are strong links between health and economic growth. (Weil 2006, World Health Organization 2001) For example, recent studies estimate that a sustained 2.5 percent growth maintained over the next decade would reduce undernutrition by a range of 27 to 35 percent (Ndulu et al 2007).

Artadi and Sala-i-Martin (2004) estimate the foregone per capita growth from low life expectancy to be as great as 2.07 percentage points annually. The index of malaria prevalence is close to 0,9 in sub-Saharan Africa – OECD and South East Asia have virtually no malaria The adverse impact on per capita growth is estimated at 1.25 percentage points. (Doppelhofer et al 2004, Artadi and Sala-i-Martin 2004). Life expectancy in SSA has gone up since the 1960s, but is declining again due to the prevalence of AIDS. Weil (2007) estimates eliminating cross-country health differences would reduce the variance of log GDP per worker by 9.9 percent, and reduce the ration of GDP per worker at the 90^{th} percentile to GDP per worker at the 10^{th} percentile from 20.5 to 17.9.

Shastry and Weil (2003) build up estimates on the effect of health from microeconomic data to avoid problems of endogeneity and drawing the wrong conclusions from regressions with inappropriate proxies.[5] They find that anemia, affecting stamina and hence productivity, explains 1.3 percent of the log variance of income per capita, whereas adult survival rate[6] (as a proxy for general health) explains as much as 19 percent, or almost one third of the unexplained variation in output. Shastry and Weil thus conclude that improving health in developing countries has the potential to bring about significant improvements in growth rates as well. However, they point out several watchouts that can lead to either over- or underestimating these effects. First, different conditions and diseases interact (e.g. eliminating malaria would decrease anemia), which may lead to either multiplicative effects on productivity or double counting if looking at the effects of reducing more than one condition and once. Second, the long-run effects of disease may be more profound than the short-term, with diseases affecting physical or mental

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[5] The authors note that the regression on anemia, which is only one small aspect of ill health, fits almost as well (R^2=0.504) as a more comprehensive measure such as adult mortality rate (R^2=0..753). Taking this result literally one would incorrectly conclude that a health intervention bringing anemia down to the same level as in rich countries would have almost the same impact as an intervention bringing mortality down to a comparable level.

[6] probability that a 15 year old will live to age 60

development having an impact on development with a lag of several years if not decades. Third, ill health may lower the educational attainment and have indirect effects such as higher fertility rates (both due to unavailability of family planning and contraceptive methods and due to lower chances of each child surviving) and lower incentives to invest in physical and human capital.

Because the impact on growth seems to be so large, it could be advantageous to target significant portions of development aid on health problems – money, technical assistance, especially R&D – before the African countries grow rich enough to fund the improvements on their own. Effective interventions on a limited number of health conditions[7] combined with investment in reproductive health would translate into significant improvements in human capital through improved worker efficiency and higher incentive to invest in education for each individual as well as help cap population growth. However, this is an argument for continued development aid, at least when targeted towards improvements in health rather than directly increasing physical capital, as currently African governments are not able to gather adequate funding for health programs without external aid. Poverty itself imposes a basic financial constraint to addressing the health needs of the population in low-income countries though waste in health spending and other areas does exist and needs to be addressed. (World Health Organization 2001)

3.2 Political and Institutional Factors

Recent work in development economics emphasizes the importance of institutions for growth and development. Institutions in this context refer to both the physical infrastructure and, often more significantly, the political and economic institutions prevailing in the country. Studies have found a positive and significant coefficient to institutional quality (Bloom and Sachs 1998) and political stability, violence correlates negatively and is significant albeit small (Bates and Nkurunziza 2003). Carey et al (2005) calculate growth in Africa could have been about 2 percentage points higher each year if policies had been as strong as those in other developing regions.

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[7] HIV/AIDS, malaria, TB, childhood infectious diseases, maternal and perinatal conditions, tobacco—related illnesses and micronutrient deficiencies

Collier and Gunning (1998) quote enlightening numbers on the physical infrastructure in SSA: the density of the rural road network is only 55km per square kilometer, compare to over 800 in India, and there are only one tenth the telephones per capita of Asia. Freight rates by rail are on average about double those in Asia. Air transport is four times as costly as in East Asia. As a result of high costs by 1991 freight and insurance payments on trade amounted to 15% of export earnings, while the average for developing countries is 6%.

While building up the physical infrastructure is costly, it is the political and economic institutions that are the trickiest to get right. Social capital can be generated both by the community and by the government. Collier and Gunning (1998) define civic social capital as the economic benefits that accrue from social interaction. These economic benefits can arise from the building of trust, which lowers transaction costs, from the knowledge externalities of social networks, and from enhanced capacity for collective action. Public social capital consists of the institutions of government that facilitate private activity, such as the courts. African governments have behaved in ways which are damaging to the long term interests of the majority in serving narrow constituencies. They have been damaging partly through "sins of commission", such as agricultural taxation, and partly through "sins of omission", such as the failure to provide adequate infrastructure. (Collier and Gunning 1998)

The legacy of slave trade and colonial rule left SSA with institutions unfavourable to growth. In comparison to institutions in their native European countries, the colonizers set up institutions that were most conducive to resource extraction. Acemoglu, Johnson and Robinson (2001) argue that Europeans were more likely to set up extractive institutions in places where they could not settle due to high mortality rates, i.e. most SSA countries because of the prevalence of tropical diseases and unfavourable climate and geography) The Cold War further exacerbated problems of inefficient government in many countries as ideological considerations overrode economical in who the great powers would back up, often leading to support of military coups and dictatorships as a perceived lesser evil.

Stiglitz (2001, 18-19) notes a growing recognition that lack of development is not only due to predatory states, but also states that fail to provide the institutional infrastructure required for a

market economy. State and the market complement each other. The state, on top of performing its own functions, has a role in helping to alter other institutions in a country. Institutional arrangements are not by necessity efficiency enhancing, they can also be wealth preserving – the state should correct market failures but also alter nonmarket institutional arrangements that impede efficiency and increase inequality.

Sub-Saharan Africa scores consistently lower than other developing countries on variables indicating institutional quality, contract enforcement, and stability (Table 4). In the below I will discuss each of these variables in turn as potential explanations for the sluggish growth rates.

	SSA	Other LDCs
Corruption	4.97	6.03
Bureaucracy	1.38	1.72
Enforceability	1.95	2.09
Civil war	1.27	0.72
Fractionalization	67.6	32.7
Social development	1.10	-0.43
Inequality	31.0	31.0

Explanation of variables:

Corruption:	Low score indicates high corruption
Quality of bureaucracy:	High score indicates better quality. Scale is 0 to 6.
Enforceability of contracts:	Low score indicates weak enforceability. Scale is 0 to 4.
Civil war:	Measured as months per year.
Fractionalization:	On the range 0-100, zero indicates complete homogeneity.
Social development:	Adelman-Morris index as of the early 1960's. Effective range of 1.86 (least) to -1.91 (most) over 74 countries that were classified as developing at that time.
Inequality:	The income share of the third and fourth quintiles.

Table 4: **Socio-Political Indicators in SSA and other LDCs.**
Collier and Gunning (1998, 5)

3.2.1 Role of the Government

The diversion of resources away from their productive use as a consequence of corruption, theft, payment of protection money, confiscatory taxation, the lobbying of the government by special interests etc. can immensely hinder growth. All these acts like taxes on businesses, reducing their profitability. The government is usually integral in this system of resource diversion; either as an active player or a passive one through the structure of incentives it puts in place (Bates and Nkurunziza 2003, Easterly 2001). Political instability often leads to economic instability, which in turn increases uncertainty and discourages investment, thus affecting growth.

Excessive public spending is generally bad for economic growth. (Doppelhofer et al 2004) Empirical research has shown the link to hold true even for public investment – which tends to be less efficient than private investment – but the relationship is more robust for public consumption. Public consumption tends not to have positive direct effects on growth and may cause crowding out of private consumption, and the taxation needed to finance it creates distortions. Public spending may also be wasteful. Fraction of GDP devoted to public spending is 0.164 in sub-Saharan Africa, compared to 0.07 in OECD, and 0.06 in East Asia. (Doppelhofer et al 2004) However, there are counterexamples of high growth rates achieved with significant government involvement, notably the case of China, which make the picture more complex.

The return on African projects remains significantly lower than elsewhere even controlling for the policy environment and civil liberties. The public sector has been used to create employment rather than to deliver services and this reduces productivity. To finance extra employment non-wage expenditures are squeezed and wages are reduced, being compensated by declining effort. Low official wages are further conducive to corruption as government officials need bribes to reach an acceptable standard of living. There is also evidence that wages in the SSA public sector reward kin group connections rather than skills (Collier and Garg 1999).

Collier and Gunning (1998) argue that the restrictive trade policies in SSA have adversely affected public service delivery, lowering the returns on public projects. Public services have also worsened due to lack of social capital. Because African governments have permitted only a low

level of civil liberties, ordinary people are denied the channel of protest and this worsens project performance.

Purpose	SSA	South Asia	East Asia	Latin America
Total Expenditure	26.0	23.5	22.9	20.4
Defense	1.8	2.6	2.1	1.6
Interest Payments	2.9	3.5	3.0	3.6
Total Potentially Productive Expenditure	21.3	17.4	17.8	16.2
General Public Services	6.9	6.2	6.3	5.3
Education	3.1	1.8	4.8	2.8
Health	1.3	0.9	1.7	1.2
Social Security and Welfare	0.5	1.4	0.7	0.9
Economic Services	5.7	7.2	6.1	3.7

Table 5: **Government Expenditures as a Percentage of GDP, average over 1985-1989.**
Collier and Gunning (1998, 8)

The share of public expenditure in GDP is generally higher in SSA than in other developing regions (Table 5). Expenditure on the most obviously non-functional items, defense and interest payments is lower, and share of potentially productive expenditure, such as health and education, is higher. Despite this, the actual delivery of public services has been poor. (Collier and Gunning 1998)

However, democracy and economic growth do not by necessity walk hand in hand. Glaeser, La Porta, Lopez-de-Silanes and Shleifer (2004) claim that less-developed countries often adopt good policies under dictatorships, and only democratize after achieving economic success under the authoritarian rule. Democratic rule would thus be a consequence of economic development, not vice versa. Barro (1997) found a relatively weak, U-shaped relationship, concluding that more democracy raises growth when political freedoms are weak, but depresses growth when a moderate amount of freedom is already established. Rigobon and Rodrik (2004) find the democracy and the rule of law are both good for economic performance and tend to be mutually

reinforcing, but rule of law has a much stronger impact. Higher incomes produce better institutions, but the effect is not very strong.

One of the main concerns in government involvement, especially so in the context of SSA, is the prevalence of rent seeking and corruption. The two terms sometimes used interchangeably with corruption and they do indeed overlap: whereas corruption can be defined as the use of public office for private gain, rent seeking means seeking to gain control over the opportunities to collect rents. Neither corruption nor rent seeking, in moderation, need necessarily be harmful to economic growth, as they may include such activities as lobbying or advertising (Coolidge and Rose-Ackerman 1997). However, the kind of activities that Jagdish Bhagwati has termed "directly unproductive rent seeking activities" – meaning any economically relevant activity that does not enter directly or indirectly into anybody's utility function – do waste resources and contribute to economic inefficiency[8]. Problems with resource rents generally arise when they accrue to the government and the revenues allow the government to engage in economically harmful but politically rational actions, such as employing people in the bureaucracy (Robinson, Torvik and Verdier 2002, 2).

3.2.2 Institutions, Rent-seeking and Corruption

Bad institutions seem to be especially detrimental in countries that discover natural resources or receive similar windfall gains (e.g. large amounts of foreign aid). Poor institutions create rent seeking opportunities, but rent seeking opportunities created by natural resources may also hinder the development of adequate institutions. These considerations are extremely relevant to many African countries since a number of them have high-value natural resources (e.g. oil, diamonds), or they have been recipients of large lump sums of foreign aid.

In particular, Sachs and Warner (1995) found in their influential study that economies with a high ratio of natural resource exports to GDP in their chosen base year, 1971, tended to have low

[8] Bhagwati 1974, cited in Coolidge and Rose-Ackerman (1997).

growth rates 1971-89. This relationship holds true even after controlling for several important factors affecting economic growth, such as initial per capita income, trade policy, government efficiency, and investment rates.

Lane and Tornell (1997) attribute the resource curse to a fierce distributive struggle for resource rents between a number of powerful interest groups. They analyze the so called "voracity effect", a process by which a favorable shock, such as a terms of trade improvement, leads to reduced growth through more-than-proportionate increase in fiscal redistribution.

In Lane and Tornell's model fiscal redistribution is endogenously determined by three variables: the existence of powerful groups, raw rates of return and institutional barriers that limit the possibilities of extracting transfers from the society. The model analyses an economy that lacks a strong legal-political infrastructure and has multiple powerful groups. The economy has a formal sector and an informal sector; the raw rate of return is higher for the formal sector, but its capital stock is not truly private, as opposed to the informal sector, which means that powerful groups may extract fiscal transfers from it. Since the financial transfers need to be somehow financed, higher transfers lead to higher taxation for the entire formal sector. Investments leak to the informal sector, as investors seek to protect their profits from arbitrary taxation. Typically investments in the informal sector yield a lower return, and the growth rate of the whole country is affected. Lane and Tornell argue that the voracity effect dominates any windfall gains.

Wantchekon (1999) explores the relationship of resource dependence to authoritarian governments and socio-political instability. He shows that resource windfalls tend to generate and consolidate incumbency advantage and increase socio-political instability when state institutions are weak and budget procedures non-transparent or discretionary. He calculated that a one percent increase in resource dependence, as calculated by the ratio of primary exports to GDP, increases the likelihood of authoritarianism by nearly 8 percent.

Ross (2000) also examines the effect of oil and other mineral resources on the development of democracy. He finds that both oil and minerals have statistically very significant antidemocratic effects of roughly the same, substantial magnitude. A state that is highly reliant on oil exports

would lose 1.5 points on a democracy scale of 0 (least democratic) to 10 (most democratic), an equal dependence on minerals would cause a 2.1 points loss. He also finds the effect to be stronger when the initial per capita GDP is lower. This is consistent with the findings that not all resource rich countries have suffered from the curse. It may be, that countries with relatively high initial per capita GDP levels also have had better institutions[9]. The findings are statistically significant and robust and provide counter-evidence for the claim that the antidemocratic effects of oil and minerals would be restricted to oil and the Middle East.

Ross also tests if other types of export commodities have a similar effect. He finds that the coefficients for both food exports and for non-food agricultural exports (as a fraction of GDP) are, in stark contrast to oil and mineral, positive. For food the result is significant at the 0.05 level, for non-food agricultural items the coefficient non-significant. This seems to support Perälä's hypothesis that the type of natural resource is an important factor. Agriculture does not seem to have the kind of link to growth performance extractive resources do.

Ross test three possible causal mechanisms that might explain this antidemocratic effect: Firstly, the rentier effect, or the use of low tax rates and patronage to relieve pressures for democratic accountability. For example Mahdavy followed this line of argument to explain the lack of pressure from below for democratic reforms in the Middle East[10]. Secondly, the repression effect, or the boost of funding for internal security. This is related to Annett's (2001) views mentioned above that governments may use funds to placate opposition – in a fractionalised society, resource rents can fund this kind of an activity. Thirdly, the modernization effect, which holds that mineral- or oil-led growth fails to bring about the social and cultural changes necessary for the development of democratic governance. Ross finds at least tentative evidence that these mechanisms do indeed work in the case of oil. The case of mineral wealth seems less clear, as there is only reasonable evidence to support the rentier effect. Robinson, Torvik and Verdier (2002) and Mehlum, Moene and Torvik (2002) also stress the importance of quality of institutions in determining the impact of natural resources on the economy. Robinson, Torvik and Verdier argue that political incentives are the key to understanding how the effect is determined.

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[9] See for example Wantchekon's (1999) comparative case studies on why oil discoveries led to political instability and economic problems in Nigeria but not in Norway.
[10] Discussed in Wantchekon (1999), 3.

They claim that politicians have a tendency to over-extract natural resources, producing inefficient outcomes, because they discount the future too much. Two contradicting tendencies, then, arise with a resource boom: the boom per se would tend to increase the efficiency of the extraction path.

First, they argue that if the resource boom is seen as permanent by the politicians, they will value future rents more and the extraction path will move closer to the socially optimal one. This prediction stands in stark contrast with the one made by Ross (1999) that increase in the price of resources will induce politicians to increase the extent of inefficient extraction, as increased rents increase the incentives to grab them. Second, at the same time the resource boom would increase resource misallocation in the rest of the economy by raising the value of being in power and increasing the means politicians have to stay in power (by influencing election results). The end result is critically dependent on whether good institutions are in place to provide the adequate checks and balances. The prediction of the model will be the same as Ross's if the resource is perceived as only temporary by the political incumbent, because in this case the political benefits of increased extraction would exceed the costs. Mehlum, Moene and Torvik (2002) also claim that more natural resources will push aggregate income down when institutions are "grabber friendly", but will have a positive impact on the economy when institutions are "producer friendly".

Perälä (2004) suggests that not only are natural resources important sources of income for their – often corrupt, undemocratic – leaders, but their presence might explain how these leaders established themselves in the first place. The economic incentives set by the abundance of natural resources combined with a weak institutional setting would lead to poor government, poor policies, and hence, poor economic performance. Perälä pays special attention to the *type* of natural resource as a determinant of the prevalence of rent-seeking: Potential rents from *concentrated* resource flows, such as diamonds or oil, are higher and more concrete than those from *dispersed* resources (mainly agricultural commodities), hence there are also greater incentives for rent seeking in economies with concentrated resources. The rent seeking tendencies render it unlikely that institutional development will be geared towards maximization of welfare for the society as a whole. This causes a significant growth disadvantage to these economies.

Perälä also finds empirical support for the argument that it is the combination of fuel and mineral endowments and high social fragmentation that cause slow growth, rather than natural resources alone; the combination consistently exhibits a robust negative correlation with growth in the regressions.

Acemoglu, Robinson and Verdier (2003) find that the likelihood of kleptocratic policies rises when the average productivity of the economy is low and opposition groups short-sightedly go after their own interests, because this makes it easier to use rents to buy off pivotal groups. Somewhat anti-instinctively greater inequality between producer groups may constrain the implementation of kleptocracy. This is because more productive groups are more expensive, and thus more difficult, to buy off.

Mbaku (1996) argues that especially in Africa, bureaucrats attempt to increase their level of compensation by lobbying lawmakers and politicians and by engaging in other activities to influence the political system and maximize benefits accruing to them. Mbaku quotes David Apter's study on Ghana[11] in arguing that the African tradition of the extended family may put significant pressure on civil servants to share the proceeds of their public offices with their kinfolk, engaging in corrupt and nepotic practices. The weak, inefficient, and poorly designed constitutional rules provide the government with almost unlimited power to intervene in private exchange. As a result, resource allocation is totally politicized and the civil service has replaced the market as the principal instrument for the allocation of resources. Rent seeking by extorting bribes from entrepreneurs is prevalent among bureaucrats.

Acemoglu, Robinson and Verdier (2003) point to the importance of both foreign aid and rents from natural resources for what they call "kleptocrats"[12] – rulers who manage to expropriate the wealth of their citizens for personal use – implementing economic policies that are highly inefficient and damaging to the economy as a whole. In their model the kleptocrat uses a form of divide-and-rule to exacerbate the problems of collective action, thus preventing the population from uniting against him. Using the income derived from foreign aid and/or resource rents, the

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[11] Apter, D.E. (1963) *Ghana in Transition*. New York: Antheneum.
[12] "Kleptocracy" means, literally, "the rule of thieves".

kleptocrat is able to buy off any potential ally group and impose punitive tax rates on the mutinous citizens. In equilibrium no one dissents, owing to the threat of such action.

The model focuses on weakly institutionalized societies, which, according to them, have been neglected in previous analyses. The degree of institutionalization has important repercussions for the nature of politics in the society: within institutionalized settings citizens may punish politicians by voting them out of power, whereas in weakly institutionalized societies politicians can punish the citizens if they fail to support them. The role of interest groups differs as well: in highly institutionalized countries groups politicians vie for their support, while within less well developed institutional settings politicians create and control them. Citizens demand rights, or beg for favors, for highly and weakly institutionalized societies respectively. Again the experience of many African nations illustrates well the divergent incentive structures in highly and poorly institutionalized economies. Good institutions mitigate the perverse incentives resource booms create, but bad institutions help to encourage corruption and rent seeking (See for example Robinson, Torvik and Verdier 2002).

Recent rise in oil prices caused windfall gains in oil-exporting African countries while debt relief has also contributed to extra cash flows to SSA countries[13]. The extra revenues have been directed at much more growth promoting projects this time around (IMF 2007), which would indicate that efforts at improving the institutions in these countries have produced tangible benefits.

However, weak institutions, poor macroeconomic policies, instability and risk of conflict continue to stifle growth in several problem countries. Zimbabwe, for instance, saw a reduction in GDP of about 6% in 2007 due to macroeconomic imbalances and price controls the government has imposed in an effort to control the rampant inflation. (IMF 2007, 4)

[13] Sub-Saharan Africa's external debt fell to three-decade low, 11 percent of GDP in 2007. Government debt has been falling consistently since 2002. However, debt levels still remain high in many countries, in particular the fragile ones. (IMF 2007)

3.2.3 Social Fractionalization, Political instability and Conflict

Violence – prevalent ethnic and religious conflict and outright civil war – has obviously had a negative impact on the growth rates of Africa. Some conflicts have arisen from natural resources such as the Biafran war in Nigeria, the Sierra Leone conflict, or the war in Congo/Zaire. Others have been tribal or ethnic wars like the conflict between Tutsies and Hutus in Rwanda-Burundi. (Artadi and Sala-i-Martin 2003) Fractionalization, a measure of the probability that two randomly selected individuals in a country belong to different groups[14], is on average around 0.6 in Africa; in comparison that of the OECD is 0.12 and of East Asia 0.2. Foregone growth from this is estimated at 0.52 percentage points. (Annett 2001)

Annett uses the degree of ethnolinguistic and religious fractionalization in the society as a proxy for the degree of social conflict. His principal thesis is that a higher degree of conflict leads to higher government consumption as more funds are used to placate opposition in fear of losing the rents from being in power. In many cases simply naming all of the ethnic, linguistic, and religious groups in these countries can be a daunting task. For example in Central African Republic, whose combined fractionalization score of 0.71 is still somewhat below the highest marks (Tanzania 0.85, Kenya 0.84), the largest ethnic groups are the Baya (33%), the Banda (27%), the Mandjia (13%), the Sara (10%), the Mboum (7%), the M'Baka, and the Yakoma (4% each). Half of the population is Christian (further divided into equal shares of Protestants and Roman Catholics), 15% Muslim, and 35% have varying indigenous beliefs. On top of the official language, French, and the lingua franca and national language, Sangho, several tribal languages are used. In the Democratic Republic of Congo (Fractionalization score 0.67) there are over 200 ethnic groups, of which the majority are Bantu. The four largest tribes – Mongo, Luba, Kongo (all Bantu), and the Mangbetu-Azande (Hamitic) make up about 45% of the population. 50% of the Congolese are Roman Catholic, 20% Protestant, 10% Kimbanguist, 10% Muslim, and the remaining 10% belong to other syncretic sects and indigenous beliefs. The many languages include the official language French, the lingua franca and trade language Lingala, Kingwana, Kikongo, and Tshiluba. (CIA – the World Factbook)

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[14] Annett (2001) uses a combined measure of ethno-linguistic and religious fractionalization

Barro and Lee (1993) use the number of revolutions, Easterly and Levine (1997) the number of assassinations as a proxy for social disturbance as a determinant of growth. Collier and Gunning (1998) use number of months of war in a country. Alesina and Perotti (1996) construct an index of political instability using variables like the number of assassinations, deaths, coups and demonstrations. Alesina et al (1996) proxy for political instability using dummy variables for regime change, regular and irregular transfer of executive power. Fosu (2001) based his measure on coups.

The results from these studies are inconclusive. Barro and Lee, Alesina and Perotti, and Alesina et al found negative and statistically significant correlation between political disturbance and growth rates. The coefficients found by Easterly and Levine and Collier and Gunning, although negative, were not statistically significant. Fosu's coefficient was positive.[15] However, this does not mean that political instability and social fragmentation do not have a negative impact on growth. There is no simple way to measure the "level of social and political disturbance" in a country and the quality of the proxies used in these studies may not be adequate. Bates and Nkurunziza (2003) point out that for example civil war is a rather rare occurrence: 85% of the countries never experienced civil war (see also Hoeffler 2000).

States in SSA are typically weak and uncoordinated, hence liable to competitive corruption. Bribes exceed the revenue maximizing level and can even eliminate transactions. The illegality of corruption and the secrecy that follows from that make it much more distortionary and costly than taxation, whose effects are otherwise similar. (Collier and Gunning 1998, Shleiffer and Vishny 1993)

Ethnic diversity in African nations is a well-known legacy of the colonial times. As the European powers drew the map of Africa with little respect for natural ethnic borders they managed to exacerbate the already high levels of ethnic and linguistic diversity. The result has in many cases been a never-ending struggle between the different groups since independence.

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[15] This is probably due to the limited nature of the sample which only consists of 31 sub-Saharan countries. Given a large enough sample the results should be different. See Bates and Nkurunziza 2003, 7.

Easterly and Levine (1997) examine specifically sub-Saharan Africa and find that a significant part of most of the characteristics that are associated with the low growth rates of these economies – low schooling, political instability, underdeveloped financial systems, distorted foreign exchange markets, high government deficits, and insufficient infrastructure – are explained by high ethnic fragmentation. This variables account for about two fifths of the growth differential between Sub-Saharan Africa and East Asia: direct effect of fractionalization is 35% of the explanation of the shortfall, while indirect effect through bad policies adds a further 10%.

Easterly and Levine use a measure of social polarization, ETHNIC, that measures the probability that two randomly selected individuals in a country belong to different ethnolinguistic groups. This measure is highly correlated with non-linguistic measures of polarization, such as violence and official discrimination against minority groups and separatist movements. This lends support to the thesis that ethnic diversity approximates the degree of conflict in society. ETHNIC correlates strongly with most of their chosen economic indicators, although direct links between ETHNIC and economic growth remain more ambiguous.

Collier and Gunning (1998) argue that ethnic diversity in Africa has been costly due to the low level of political rights. Ethnic diversity reduces growth rate by 3% per annum in dictatorships but has no effect in full democracies. Collier and Gunning attribute the lack of political rights to the special heritage of African governments. Firstly, the political leadership that came to power after independence was drawn from a tiny elite of educated young men that were essentially out of touch with the people. The lack of representativeness was quickly institutionalized. Secondly, the modern part of the economy was owned by ethnic minorities, often Europeans. Even in 1991 only 13% of the population was living in states in which legislators had been chosen in contested multi-party elections.

The combination was conducive to a policy of taxing agricultural exports or, if available, mineral exports, to finance the expansion of industry and to grandiose schemes. A controlled banking system allowed both lowered interest rates and favorable credit conditions to the favored sectors, causing further distortions. Anti-export policies were widely adopted between the mid-1960s and the mid-1970s (Ghana, Tanzania, Uganda, Ethiopia, Mozambique, and Angola socialist regimes,

Nigeria, Zaire, and Zimbabwe). More market-oriented exceptions arose where the political elite had an interest in export agriculture, such as Côte d'Ivoire, Kenya, and Malawi. (Collier and Gunning 1998)

3.3 Openness, Trade and Integration to World Economy

Until relatively recently it was generally accepted that trade liberalization was conducive to growth and development. The literature on development reflected a consensus on the positive impact of liberalization on growth. Opening up to external markets would improve allocation of resources and promote the orientation of investments towards more productive sectors (notably: exporting sectors which were no longer held back by focus on domestic markets). (Ben Hammouda 2004) More open countries tend to benefit from trade and have more access to foreign technological progress through FDI. Bloom and Sachs (1998) find a positive and significant coefficient for openness. Sachs and Warner (1997) identify economic policies, especially lack of openness as the main reason for slow growth in Africa. They quote an index of economic openness of 0.10 for the African continent – in stark contrast with 0.65 for the OECD, or 0.83 for East Asia. Artadi and Sala-i-Martin (2003) estimate that if Africa had been as open as the OECD, growth would have been 0.67 percentage points higher.

Also Collier and Gunning (1998) note that African regimes focused on controlling international trade, whether directly through quotas, tariffs, and export taxes or indirectly through foreign exchange controls and marketing boards. By the 1980s Africa had become much less open than other regions. Notably the gap between Africa and the next most restrictive area, the Middle East, was wider than that between the Middle East and the most liberalized region, the Far East. Collier and Gunning also find that a given level of trade restrictions is more damaging in Africa than in other regions due to the smaller size of SSA economies.

However, following the failure of much of the Structural Adjustment Programs, critique towards the view that more openness is always beneficial has mounted. There are several success stories

of high growth through unorthodox means that provide powerful counterexamples of the benefits of a more cautionary approach, such as China, that make the picture more complex. China reports per capita growth rates of ca. 9% since the 1980s. While it has certainly become more market-oriented, it hasn't done so conventionally. It has created a two-tier system incorporating a market system on top of, rather than replacing, the planned system, its private property rights are much less prominent than those in the west, and only partially opened its economy to international trade. South Korea and Taiwan have made extensive use of trade protection and industrial policy, adopting anomalous institutions in corporate governance, finance, and regulatory areas. (Rodrik 2004)

Rodrik, Subramanian and Trebbi (2002) estimate the respective contributions of institutions, geography and trade in determining cross-country variation in income levels. Their primary finding is that institutions are the most important factor. The isolated direct effect of measures of geography is very weak, although geography has an indirect impact through influencing quality of institutions. Similarly, the effect of trade is almost insignificant if institutional quality is controlled for, often even appearing to be negatively correlated with growth, although trade seems to have a positive impact through its positive impact on institutional quality.

Heavy dependence on a small number of primary exports (e.g. oil, diamonds, coffee, tea, copper, cocoa, palm oil, and rubber) has typically made countries in SSA extremely vulnerable to fluctuations in world market prices. Terms of trade have typically declined since the 1980s, accounting for a reduction in growth rates in Africa vs. other developing regions of 0.7 percentage points (Collier and Gunning 1998). The natural volatility of commodity prices is further compounded by volatility in policies, especially since African governments have often used trade policy as an instrument to correct for current account deficiencies. Collier and Gunning (1998) cite real exchange rate fluctuation as an indicator of this phenomenon and find the rates have been unusually volatile.

Recent growth in SSA has been partially fuelled by favorable changes in terms of trade: over the past 3 years there has been an overall improvement of 26%. While a significant part of this comes from increase in oil prices, also non-oil exports of African countries continue to see double-digit

price increases and demand seems robust. (IMF 2007) However, Charalambos Tsangarides identifies in the IMF (2007, 7) report on SSA only a weak link between terms of trade improvements and growth spurts in the region since 1980s. This is not to say that the improvements have not helped, but points to other factors being equally if not more important. Encouragingly middle- and low-income and fragile countries have all grown in recent years despite stable or declining terms of trade. IMF (2007) accounts this to rising investment and productivity, reflecting efficiency gains from structural reforms and overall improvements in the business climate and macroeconomic policies.

3.4 Geography and Demography

Bloom and Sachs (1998) argue that the root of SSA's problems is its highly disadvantageous geography and geographical factors are the key to understanding the region's societies and interactions with the rest of the world. Its climate, soils, topography and disease ecology all raise obstacles to growth. Low agricultural productivity, disease and low levels of international trade that contribute to low growth rates are a consequence of geographical realities.

It has been found in many studies that a tropical climate is not good for growth. Artradi and Sala-i-Martin (2003) find a measured effect of 1.21 percentage points due to "tropical geography". 92% of sub-Saharan Africa lies in the tropics, compared with only 3% of OECD and 60% of East Asia. (Artradi and Sala-i-Martin 2003). It is unlikely that geography per se would be a major determinant of growth. A more plausible thesis is that it has an indirect effect on the determinants of growth through its impact on economic, political and social institutions. Collier and Gunning (1998) also cite malaria as an important factor stemming from the tropical conditions.

Tropical diseases reduce worker productivity and the incentives to invest in education and health. A tropical climate also constricts the productivity of agriculture, also indirectly as in agriculture tends to be climate-specific. Thus it is not possible to copy more advanced, productivity-enhancing technologies from richer countries. (Sachs and Warner 1997, Gallup, Sachs and

Mellinger 1998, Sachs 2003) Bloom and Sachs (1998) note that manufacturing technology is much less climate-bound and growth success stories in tropical climates have almost invariably been countries that have successfully promoted their manufacturing or service sectors[16].

Collier and Gunning (1998) argue agricultural production in important parts of SSA is intrinsically risky due to semi-arid conditions. A third of the available land is too dry for rain-fed agriculture and about half of the rest is of marginal quality. A corollary of the semi-arid conditions is low population density. Because of this transport costs are intrinsically high even aside from policy-induced deficiencies of infrastructure. This is compounded by the fact that the population is disproportionally landlocked. (See Appendix 2 for map)

Bloom and Sachs (1998) also note that SSA's demographic conditions further thwart growth, and that these conditions are likely to be linked to geography and economic conditions. High fertility rates combined with falling infant mortality rates have produced the highest dependency ratios in the world, substantially reducing productivity per capita. Low life expectancies and youth-heavy age distributions are, moreover, associated with lower rates of saving and investment. However, not enough is yet known about the interplay between geographical factors and such determinants of growth to make definitive claims.

Demography can to some extent be influenced (female education, availability of contraceptives, family planning), but geographical realities are a permanent fact of life. Bloom and Sachs (1998) note that taking geography into account should not mean hiding behind a sort of "geographical determinism" – saying that Africa would be destined to be poor due to its adverse geography – but rather a recognition that another region's economic history and technology may not in all cases be directly applied to another region.

The geographic peculiarities of the reason may well explain part of the country-specific variation in growth regressions. Bloom and Sachs (1998) estimate that about two thirds of the shortfall in SSA growth is attributable to "non-economic" conditions (geography, demography, public

[16] For example Hong Kong and Singapore in Asia and Mauritius as an exception in the SSA (Bloom and Sachs 1998, 4).

health) and only one third to economic policies and institutions. However, since the non-economic conditions are not easily changed, policy remains important. Factors deriving from geographic location or political history of a country are largely irrelevant for policy recommendations. While its important to understand how the country got to where it is today in the first place this cannot be changed; any future policies must take history and geography as given and work from the preset conditions or we will only achieve what Dixit (2005) calls Irish recipes of success after a joke about what an Irishman replied when asked for directions: "If I wanted to go there, I wouldn't start here".

Ndulu et al (2007) propose different strategies to be followed by African countries based on their different geographical and natural endowments and drawing on the growth experiences elsewhere. Coastal countries could follow the Asian model of manufactured export-led growth while resource-rich countries should try to imitate Botswana's success in managing its resource rents. The Chilean model of agribusiness and the Malaysian model of agro industrialized export would serve as a basis for natural resource-based agricultural export diversification and industrialization. Landlocked countries could find success in the Indian model of labor export and high value service sector.

3.5 Beyond the Washington Consensus

The so-called Washington Consensus has long advocated the same key policies irregardless of individual country's circumstances: economic liberalization, especially trade liberalization, the creation of a stable macroeconomic environment with low inflation, and privatization. The policies were applied to the greatest extent in Latin America, but many countries in SSA also adopted the same packages. The radical policy changes failed to produce the radical results that were expected – even relative to the countries that were reluctant to reform (Rodrik 2004).

The first response was to augment the Washington Consensus with additional agenda points, mainly incorporating institutional factors in addition to the purely economic ones on the original

list. The new criteria certainly are ambitious, almost to the point that it becomes impossible for any real-world government to implement it in its totality. Moreover, the consensus reflects more the ideal end-state of a country once it has finished fighting all the challenges and emerged as a developed economy rather than practical guidelines as to how to get to that ideal state – and it hardly reflects the path today's developed countries have historically taken.

The fundamental causes of slow growth are likely to vary from case to case. The need to avoid cookie cutter solutions and to develop context- and case-specific policies is becoming the new conventional wisdom. Rodrik (2004) ascribes this partly to a reaction against the rigidness of the Washington consensus, partly to the unwilling admission that practice has shown unorthodox policies (e.g. many Asian growth stars) can be growth-promoting. There may not be a panacea for economic growth – but that doesn't mean we know nothing about determinants of economic growth and cannot come up with recommendations for what is likely to produce positive results in individual cases.

The promising idea is that countries do not need to "get everything right" to be able to grow. While the augmented Washington Consensus seems to dictate that in order for a country to develop it needs to have the social, economic and political climate and structure of a developed country already in place, practice has shown this is not needed. What is needed is the right balance between "anything goes" and "universal laws". Behind the chaos of different theories most economists do agree on the fundamental factors of growth and it is possible to find some broad universal economic policies. However, to get to a useful level of analysis for a country to base its policies on two things are needed: (1) sense of priorities for what should be reformed and (2) openness towards the exact (institutional) form in which a policy should be implemented.

4 Growth Diagnostics – A Decision-Tree Approach to Policy Advice

"Policies that work wonders in some places may have weak, unintended, or negative effects in others." (Hausmann, Rodrik and Velasco 2005)

Economists can run thousands of regressions and trace the historical circumstances preceding periods of high growth in different countries. However, this knowledge is not easily translated to practical policy advice, and replicating the growth spurts let alone sustained high growth in problem areas is tricky to say the least. Causalities are oftentimes unclear, and circumstances vary. What seems to work in one place may cause nothing short of a catastrophe when applied somewhere else.

Hausmann, Rodrik and Velasco (2005) propose a strategy for working out the correct, or at least the probably best policy action in different settings. Their thinking is a decision-tree approach to the problem as opposed to broad, all-encompassing cookie cutter theories. The authors claim that their framework can help analyze any given situation and be used to formulate growth strategies that are "both operational and based on solid economic reasoning" (Hausmann, Rodrik and Velasco 2005).

Different situations call for different strategies, but a nihilistic "anything goes" –attitude won't take us very far. The key idea is that the focus should be on finding the *binding constraint*, the tightest bottleneck for growth, that gives the biggest results for a given reform effort.

The approach starts not by focusing on specific distortions, but by identifying, with the help of a growth model, the proximate determinants of growth that have the largest direct impacts on growth and consequently searching for associated distortions whose removal would make the largest contribution to alleviating the constraints on economic growth. From the literature we can see that while a disagreement over the exact causes and fixes for slow growth prevails, there are certain general conditions that are, by and large, accepted as growth promoting:

- Good institutions, rule of law, property rights,
- Market-oriented incentives.
- Adequate returns to investment, private appropriability of the returns
- Macroeconomic stability, sound monetary policies, sustainable public finance
- Social cohesion and political stability

Hausmann et al (2005) claim that their approach can encapsulate all the literature as special cases and that the basic disagreement between the proponents of the Washington consensus and those of more state-led strategies can be explained as a disagreement over the most binding constraints.

4.1 Optimality, Second Best and Partial Reform

In an ideal world reform in a developing country could be aimed at eliminating all the market imperfections at once, thus reaching the optimal conditions. In the real world this is rarely if ever a feasible option. The theory of Second Best examines what happens in such circumstances – when one or more optimality conditions are not satisfied.

The theory states that when one optimality condition is not satisfied in an economic model, likely all other optimalities will change as well. In other words, if there are more than one market imperfections and not all of them are addressed simultaneously, the corrections made can either increase or decrease welfare. (Lipsey and Lancaster, 1956-1957) A seemingly simple answer to this problem would be wholesale reform mentioned above, correcting all the distortions at once. However, this is a highly impractical solution, as one would not only need to know all the possible distortions, but also to have the know-how and resources to correct them. Hausmann, Rodrik and Velasco (2005) refer to political capital, which translates roughly to the policy maker's power to impose and execute reforms. In practice trade-offs and priority calls need to be made.

Boadway (1994) notes that viewing policy problems as second-best problems eliminates the possibility of simple policy prescriptions. In certain circumstances even relatively unorthodox policies such as quantity restrictions, in-kind transfers, and public provision of social insurance may become efficient policy instruments. Boadway also stresses the time-inconsistent character of second best policies.

It is not a new idea that developing countries face both greater challenges and more constraints than developed countries do. However, multilateral organizations still typically promote a best-practice model, insisting on an ideal set of institutions all countries should strive to converge to. Rodrik (2008) argues that a second-best approach to institutional reform would help to identify ways to achieve the desired ends at lower cost or to avoid having a well-intended reform backfire. Difficulty with all reform given second-best conditions lies in the complex interplay of the variables; it is very hard if not impossible to identify all relevant variables and their interactions ex ante.

4.2 The Policy Maker's Decision in Second-Best Situations

Distortions can be government-imposed, like taxes, or they may arise from the nature of the markets themselves (externalities, spillovers and the like). Because of the distortions the private valuations of the economic activities in question do not equal the social valuations. This has significant consequences to optimality of different policies and reform attempts.

Assume a very general social welfare function $u(\mathbf{c})$, where $\mathbf{c}$ denotes the aggregate consumption vector $\mathbf{c} = \{c_0, c_1, ..., c_T\}$ over time [0,T]. A benevolent policy maker sets to maximize the social welfare function $u(\mathbf{c})$, subject to the relevant constraints.

Let $\mathbf{k}$ represent the resource endowment, or the vector of productive factors (including physical and human capital) over time and $\mathbf{y} = \{y_0, y_1, \ldots, y_T\}$, t = [0,T] denote the aggregate production function over time. The aggregate production depends on the resource endowment with the shape

of the function in turn defined by the available technology. In its general form the technology constraint can be expressed as $\Gamma(\mathbf{k},\mathbf{y}) \leq 0$. The second constraint is the intertemporal budget constraint, expressed as $B(\mathbf{y},\mathbf{c}) \leq 0$. In the absence of distortions the planner's decision problem now becomes

$$\text{Max } u(\mathbf{c}) \qquad s.t.$$

$$\Gamma(\mathbf{k},\mathbf{y}) \leq 0 \tag{5}$$

$$B(\mathbf{y},\mathbf{c}) \leq 0 \tag{6}$$

and the optimal solution is found when social marginal utilities of consumption equal social marginal resource cost at each point in time. However, as distortions are introduced the picture gets more complicated.

Let $\boldsymbol{\tau} = \{\tau_1, \tau_2, \ldots, \tau_k\}$ denote the distortions, τ_i representing distortion in activity i. Each distortion drives a wedge between private and social valuations of specific economic activities that needs to be factored into the problem as an additional constraint. The social net marginal valuation of activity i can be presented as $\mu_i^s(c,y,k,\tau)$, while $\mu_i^p(c,y,k,\tau)$ represents the net marginal valuation of that activity by private agents. In equilibrium both the private and social valuations for each i depend on all the distortions in the economy. Thus a distortion in any one of the economic activities affects the first order conditions in all of them. The additional constraints arising from the distortions take the following general form:

$$\mu_i^s(c,y,k,\tau) - \mu_i^p(c,y,k,\tau) - \tau_i = 0 \tag{7}$$

Where $\mu_i^s(c,y,k,\tau)$ denotes the social net marginal valuation and $\mu_i^p(c,y,k,\tau)$ the private marginal valuation of activity i. With the additional constraints the Lagrangian of the decision maker's problem now becomes

$$L = u(\mathbf{c}) + \lambda_T \Gamma(\mathbf{k},\mathbf{y}) + \lambda_B B(\mathbf{c},\mathbf{y}) + \sum \lambda_i \left[\mu_i^s(\mathbf{c},\mathbf{y},\mathbf{k},\boldsymbol{\tau}) - \mu_i^p(\mathbf{c},\mathbf{y},\mathbf{k},\boldsymbol{\tau}) - \tau_i\right] \tag{8}$$

where $\lambda_T \geq \lambda_B \geq 0$ and $\lambda_i \geq 0$ are the Lagrangian multipliers associated with each of the constraints. From the envelope theorem we get that the social welfare effect of a distortion τ_j is the partial derivative of L with respect to τ_j:

$$\frac{du}{d\tau_j} = \frac{\partial T}{\partial \tau_j} = -\lambda_j + \sum_i \lambda_i \frac{\partial \left[\mu_i^s(\mathbf{c},\mathbf{y},\mathbf{k},\boldsymbol{\tau}) - \mu_i^p(\mathbf{c},\mathbf{y},\mathbf{k},\boldsymbol{\tau})\right]}{\partial \tau_j} \tag{9}$$

This expression captures both the direct and indirect effects of reducing any given distortion. The value of the distortion τ_j can be assumed to be strictly positive without loss of generality. A (marginal) reduction in the size of τ_j now increases welfare by the amount of the multiplier associated with activity j, λ_j. This is the direct effect: the higher λ_j, the more costly the distortion. If activity j is undistorted, $\mu_i^s(c,y,k,\tau) = \mu_i^p(c,y,k,\tau)$ (see (7) above) – private and social valuations are equal and the constraint ceases to bind and $\lambda_j = 0$.

We can now see that if activity j is the only distorted activity, the second term on the right-hand side vanishes, as $\lambda_i = 0$ for all $i \neq j$. When more than one distortion is present, the second term captures the effect of the change in τ_j on the weighted sum of the gaps between social and private valuations of the other activities, with the weighs equal to each distorted activity's Lagrangian multiplier. The overall effect of reducing distortion τ_j now depends on the balance of changes in the gaps between social and private valuations of other activities. If the sum of the interaction effects overall reduces the gaps, the indirect effect on welfare is positive. If, however, the effect is to widen these gaps, some of the welfare increase from reducing τ_j will be lost – in some cases the indirect effects may be so large and negative that a reduction in τ_j will lead to a welfare loss.

Although the technically correct way would be to attack all distortions simultaneously (would lead to maximum welfare and eliminate all second-best issues) this would require immense political and administrative capabilities – almost by definition not present in developing nations – as well as complete knowledge of all prevailing distortions. Large scale reforms are likely to fall prey to second best effects – and even if these were negligible, the limited amount of "political

capital" available to the decision makers may render large scale reform unattainable. It would thus seem most promising to tackle reform by explicitly taking into account the second-best conditions.

The authors suggest that targeting the distortions with the biggest direct impact on welfare, λ_j, as a priority makes more sense than targeting based on the size of the distortions (τ_j). Policy makers may not always have reliable data on the size of all existing distortions, and the biggest distortions may not be on activities that have the highest growth impact. Looking back to equation (9) we can see that if λ_j is big, the equation is overall more likely to be positive. In the absence of perfect knowledge of all second-best effects and given limited resources, focusing on the distortions with the biggest impact, i.e. the binding constraints on growth, is likely to provide the best results.

The framework clearly demonstrates the major problem inherent in capture-all programs such as the augmented Washington consensus: by not calling out priorities and setting policy makers on an impossible quest of fix-it-all, the consensus encourages attempts to reform "as much as possible, as quickly as possible" which may turn out to be a waste of precious resources or outright harmful to the economy. Going after too many targets at once may also lead to missing the most urgent ones.

4.3 Finding the Binding Constraints on Growth

Defining the binding constraints directly is as difficult a quest as finding all the distortions and their second-best effects in an economy. Hausmann et al (2005) suggest an approach that narrows down the possibilities so it becomes easier and clearer to see where to look. They start by looking at the proximate determinants of growth as defined by previous literature (saving, investment, education, productivity, infrastructure, institutions etc) and move down a decision tree crossing out alternatives as they go on. At its most basic, low growth can be blamed on one of three reasons: low returns to economic activity, inadequate private appropriability of the returns or

high cost of financing. After identifying the most burning general problem, the diagnostic analysis then breaks it down to smaller components to identify which specific distortions are causing the constraint.

The model Hausmann et al use is a simple endogenous growth model with a number of distortions. A representative household has partial access to the world capital market: it can borrow abroad, but is subject to a collateral constraint (the first distortion). The household can accumulate capital, used to produce productive inputs that are sold to the firm. An externality in the production of productive inputs creates a second distortion, partially offset by a public subsidy to the hiring of productive inputs.

For simplicity I will skip directly to the results of the model.

Along the balanced growth path consumption and capital grow according to

$$\frac{\dot{c}_t}{c_t} = \frac{\dot{k}_t}{k_t} = \sigma[r(1-\tau)-\rho] \qquad (10)$$

where a dot over a variable denotes the rate of change over time and

c = consumption

k = capital

r = rate of return on capital

τ = the tax rate on capital (actual or expected, formal or informal)

ρ = the world rate of interest

σ = intertemporal elasticity in consumption

and private return on capital is defined by

$$r = r(a, \theta, x) \qquad (11)$$

where

a = indicator of total factor productivity

x = availability of complementary factors of production, such as infrastructure or human capital

θ = index of externality (a higher θ indicates larger distortion)

Having identified the different factors that can contribute to growth rates it is possible to start to identify which one is the tightest bottleneck in the specific case under examination.

4.3.1 Low Growth Caused by Low Returns to Economic Activity

Low social returns can be due to:

- poor geography that depresses productivity (low x)
- low human capital (relative shortage of skilled workers) (low x)
- bad infrastructure (Insufficient infrastructure, high transport, telecommunication or shipping costs) (low x)

To identify whether these factors are a significant constraint to growth the country should be compared to others at similar levels of income: is the infrastructure worse than average of the peer group? Is the country unusually far from its trade partners?

Low private appropriability of returns can be due to either government of market failure. Government failure can be on a micro level: high corruption levels, crime, lack of property rights or insufficient enforcement thereof, high tax rates or inefficient tax system (high τ) or on a macro level: financial, monetary, or fiscal instability.

Market failures can be either:

- Information externalities: lack of R&D, too little "self-discovery", would show as a shortage of new investment ideas and absence of the policy setting needed to exploit new opportunities. (low a)
- Coordination failures/externalities (high θ) or
- Limited access to imported technologies (low a)

4.3.2 Low Growth Caused by High Cost of Finance

For any return on investment, capital accumulation is kept low by a high ρ. As ρ may be interpreted as the world rate of interest, a high value of this parameter signifies high spreads in international lending. The problem may lie in either bad local finance or bad international finance, with such drivers as high collateral requirements, credit ceilings, or high fees.

If investment is constrained by high cost of capital at home we expect the economy to utilize foreign borrowing opportunities at maximum. Current account deficit would be as high as foreign investors' willingness to lend allows. Domestic banks would face unconstrained credit demand. Increases in autonomous foreign transfers (terms of trade improvement, foreign aid etc) would result in an overall increase in investment levels rather than a decline in domestic savings. (Rodrik 2004)

Bad local finance can be caused either by

- low domestic saving or by
- poor intermediation (too little bank competition, high spreads)

When domestic capital markets work badly, collateral cannot be aggregated effectively among domestic borrowers, (Caballero and Krishnamurthy 2003) and the risk of banking crises and non-payment rises. Both of these also increase the cost of foreign capital.

Bad international finance may be due to

- to high country risk
- unattractive FDI conditions
- excessive regulations on the capital account
- debt maturity and denomination increasing macro risk

Hausmann (2006) argues growth is neither a natural outcome of "getting the basics right", i.e. international integration, macroeconomic stability and contract enforcement, nor necessarily hard, requiring an extensive agenda of first, second and third generation reforms. Growth accelerations are more effectively created by removing the binding constraints than going

through a long laundry list of reforms. Growth involves also coping with market failures, not exclusively removing governmental inefficiencies. For sustained growth this process needs to be dynamic, where the constraints are identifies as they become the binding ones and solutions are implemented, overcoming market failures while containing government failures.

4.4 Critique of the Model and Discussion

While the model itself seems simple and clear it is not straightforward to identify the most binding constraints in practice. For example Rodrik (2008) compares the effect of a weak judicial system in two countries with vastly different growth rates: Ghana and Vietnam. Both have developed a practice of relational contracting to substitute for the inadequacy of the formal jurisdiction. While it would be easy to conclude from the Ghanaian example that strengthening the judicial system would be key to lift the constraints on growth, the case of Vietnam shows that similar informal substitutes as are already in place in Ghana can also be conducive to efficient private sector activity – the Vietnamese economy has been growing at an average 8% annually. An alternative approach could therefore be to focus efforts in enhancing the existing practice by for example improving gathering and dissemination of information about the reputation of firms, especially if large-scale reforms of the judicial system prove to be too costly, at least as a first step. Early efforts at reform could also be more targeted at those who cannot easily access relational contracting (e.g. foreign firms or start-ups).

A practical implication of the shift of focus from one-size-fits-all policy prescription to case-by-case analysis is that ownership of policy reform at the local level becomes increasingly important. If knowledge of the local conditions and restraints is crucial to identifying both the most binding restraints and the most efficient and effective way to reform, then local involvement is key to success. Rodrik (2004) notes international agencies have indeed shifted from emphasizing structural adjustment and conditionality to country ownership and country-generated poverty reduction strategies.

The macroeconomic research on the reasons for slow growth in sub-Saharan Africa has focused on growth regressions. While the regressions have revealed important information on the correlations of several possible underlying factors with growth rates and allows for a theoretically justified and reasonably rigorous approach to the problem, the method has its limitations. The approach is highly aggregative, leaving little room for country-specifics.

Growth regressions have been an important tool in finding out the proximate causes of economic growth. It is important to augment the information from the regressions by detailed country and case studies that shed more light on the specific circumstances of each problem case. Growth diagnostics is a useful tool for analyzing real life cases for the purposes of practical policy recommendation. It draws heavily on existing literature to be actionable: knowledge of economic theory and a sound understanding of the different variables at work is required to move down the decision tree, it doesn't work as a simple "tick the box" –exercise. The framework only gives reliable results with robust analysis, and a lot of data is needed to decide which factor is the most binding one. It is only an aid to analysis, doesn't replace the analysis itself and the logic by which a policy maker or an economist comes conclusions on the binding constraints will always be contestable.

Importantly the model only helps to identify what is the most influential factor holding back the growth: it does not recommend specific steps that should be taken to correct the problem... It points out the most burning *problems*, not the *exact solutions* in terms of the specific form the policies and institutions should take. For that a certain degree of judgment and creative experimentation is still required.

Rodriguez (2006) points out that since it is likely the policy maker cannot reach the first best solution and will not know what the second-best solution is, the problem becomes analogous to a non-linear programming problem where both the function and the constraints are so non-linear that it is impossible to tell where the maximum lies. He draws two important conclusions from this: first, that changing one policy at a time is a very inefficient approach. While changing the most important bottlenecks first we do increase the probability that the outcome will be positive,

this is not a given. Changing one parameter at a time may not only increase the time it takes to reach an optimum but also cause us to diverge further away from it.

Secondly, it is possible to get stuck at a local instead of a global maximum, in a kind of a "poverty trap" where low productivity, low level of technology and low demand feed off of each other. In such a situation relaxing one binding constraint may not be helpful so the only possible way out is a risky, painful and costly reform in several policy dimensions at once. However, using the growth diagnostics framework is still helpful to identify when such large-scale interventions are absolutely essential and when a more gradual approach can still be helpful.
Dixit (2005) argues that the sequential nature of a decision-tree model fails to take into account that a single development failure can have multiple causes simultaneously. He attempts to build on the diagnostics analysis by substituting the linear approach with Bayesian inference[17]. Dixit builds a table of possible causes, the prior probabilities (based on historical analyses, e.g. regressions on historical data) with which these causes can occur and various conceivable outcomes. This gives us conditional probabilities that outcome E_i will occur when a cause C_i is present, and, conversely, the Bayesian posterior that for observed outcome E_i , a particular cause C_i is present. If we can find an outcome E_i that is very unlikely to occur when the underlying cause is any other cause (posterior probability of C_i is close to 1 conditional on observing E_i) and that is very likely to occur when C_i is present (posterior probability of C_i is close to 0 if some other effect is observed) we can be nearly certain the said cause C_i is present.

It is interesting to look at some of the best and worst performers in the SSA to see whether growth diagnostics can help explain some of the growth history and pinpoint current bottlenecks. If we're able to compare countries with similar initial conditions but highly diverse growth experiences it may be possible to explain some of the variation by looking at the policies implemented in them.

[17] Statistical inference in which evidence or observations are used to update or to newly infer the probability that a hypothesis may be true.

4.4.1 Country Cases

To identify countries with surprising growth trends Carey et al (2005) benchmark African countries' actual growth performance relative to their expected growth, based on a set of exogenous opportunities. The framework proposes that opportunities for growth vary between countries depending on availability of natural resources, location, initial societal and political conditions and other such characteristics. The political and policy choices as well as other events will then influence the actual growth that a country reaches. Carey et al use a set of exogenous determinants: (1) geographic dummies (share of land in the tropics), (2) the predicted ratio of trade to GDP in 1998, aggregated from a trade gravity model, as a determinant of exposure to trade, and (3) a settler mortality rate that seeks to capture institutional quality and current health conditions augmented by such time varying but exogenous variables as growth in trade partners, terms of trade, and initial GDP levels to cover for convergence effects. The results for panel regression (Table 6) on 60 countries in the time period 1960-2000 highlights the following as outliers from the expected:

	1960-2000				1990-2000		
	Actual Growth	Predicted Growth	Difference		Actual Growth	Predicted Growth	Difference
Top 10				Top 10			
Botswana	6.73	0.90	5.83	Uganda	3.25	-0.19	3.44
Seychelles	2.83	0.11	2.73	Mauritius	4.74	1.75	2.99
Mauritius	3.86	1.92	1.94	Botswana	2.87	-0.10	2.97
Mali	0.35	-0.66	1.01	Seychelles	3.19	0.27	2.82
The Gambia	1.44	0.44	1.01	Burkina Faso	3.21	0.45	2.77
Equatorial Guinea	1.23	0.38	0.95	Mali	1.87	-0.72	2.58
Nigeria	0.65	-0.18	0.83	Mozambique	2.92	0.71	2.21
Kenya	1.28	0.50	0.78	Ghana	1.82	-0.06	1.88
Rep. of Congo	1.23	0.47	0.76	Benin	1.60	-0.16	1.76
Cote d'Ivoire	0.50	-0.09	0.59	Namibia	0.63	-0.45	1.07
Bottom 10				Bottom 10			
Angola	-0,72	0.17	-0.89	Rwanda	-1.37	0.66	-2.02
Togo	-0.33	0.59	-0.92	Rep. of Congo	-1.43	0.66	-2.09
Nigeria	-0.60	0.48	-1.07	Togo	-2.10	0.05	-2.15
Madagascar	-1.34	0.17	-1.52	South Africa	-0.67	1.51	-2.17
Senegal	-0.85	0.73	-1.58	Central African Rep.	-1.82	0.61	-2.43
Central African Rep.	-0.55	1.03	-1.58	Cameroon	-2.58	0.45	-3.03
South Africa	0.53	2.13	-1.60	Angola	-2.62	0.68	-3.30
Ethiopia	0.28	1.89	-1.61	Zambia	-3.28	0.35	-3.64
Zambia	-0.92	0.78	-1.70	Sierra Leone	-8.56	0.18	-8.74
Sierra Leone	-1.89	0.25	-2.14	Dem. Rep. of Congo	-8.22	0.18	-8.40

Table 6: **Top and Bottom Performers by Growth Benchmarking.**
Carey et al (2005, 51)

Carey et al (2005) note that the good and the bad performers relative to their benchmarks tend also to be the good and the bad performers overall. Looking at the bottom performers it is evident that disruptive conflict has been the major cause of slow growth in a number of them: Sierra Leone, Democratic Republic of Congo, Angola, Rwanda and Cote d'Ivoire have all suffered from the destructive effects of war, conflict and displacement. However, conflicts do not explain away all of the slow performance.

Mauritius, one of the consistently top performers, is in many respects similar to Cote d'Ivoire. Both countries are coastal and resource poor. However, Cote d'Ivoire's growth has been stagnant or declining while Mauritius has consistently improved its living standards. Mauritius' phenomenal success at maintaining healthy growth over four decades has been based on a private-sector lead effort at export diversification, backed up by institutional reforms and financed by rents from preferential sugar export agreements into Europe.

While Cote d'Ivoire was comparatively at a worse position initially in terms of human capital (life expectancy, educational attainment). However, the major contributor to the problem seems to have been the policy choices: instead of export-lead growth the country opted for import substitution financed by taxing of the agricultural sector and FDI. After initial success the income per capita started to decline in the 1970s. Agriculture, mainly cocoa and coffee still account for majority of the exports[18], and the country has been hit hard by declining terms of trade due to the overspecialization in cocoa. Majority of the earnings from investment in the industry fled the country in the forms of tax-free profits, salary remittances and repatriated capital, the cost of attracting FDI into the country with powerful incentives. (Ndulu et al 2007) The decline of per capita income levels was worsened by the declining terms of trade and currency overvaluation, as well as political turmoil that hit the country in the late 1990s, escalating into a civil crisis in 2002-2003. While the impact of the crisis on both the economy and at the human level is undeniable, the underlying causes of the slow growth are those of longer term build-up: the over reliance on a single commodity for exports and the stagnant TFP despite gains in human capital accumulation. The currency was devalued in 1994, bringing in gains in competitiveness which

[18] In 2004 60% of export earnings came from agriculture, down only slightly from 75% in 1965. 40% of the total was from coffee and cocoa. (Ndulu et al 2007) At the peak in 2000 cocoa alone represented 80% of Cote d'Ivoires commodity exports, more than half of all exportet goods and 21 % of the GDP (Bogetic et al 2007).

have to a large extent been preserved. Looking forward, Cote d'Ivoire should strive to stabilize the political and security fronts while diversifying the economy to lessen its vulnerability to terms of trade shocks. (Bogetic, Noer and Espina 2007)

Botswana is often cited as somewhat of an African miracle. Small, landlocked and resource-rich, it would have been a prime candidate for the resource curse, but has instead become a role model for a progressive African state. It can now boast the status of a middle-income country with one of the fastest growth rates in not only Africa but in the world (Ndulu et al 2007). At independence the future of the country did not look so bright, and countries such as Ghana, Nigeria, Kenya and Cote d'Ivoire were thought better equipped to be the pace setters of African development with their better developed infrastructure and resource endowments. Colonial legacy and dominance of the apartheid regime in South Africa curtailed the economic development from achieving its fullest potential, but the political leadership and sensible policies of the indigenous political elite made the miraculous transformation of the economy possible. (Samatar 1999) On top of the strength of the state and institutional capacity in Botswana Ndulu et al (2007) name some other factors that contributed to the success: relatively efficient infrastructure from the close ties and proximity to South Africa, a long period of customs and monetary union with South Africa as a check against rent seeking activities, and further checks, control and self-discipline in public spending and use of mineral rents. Government avoided overspending and invested prudently in human capital and social well-being while ensuring prudent macroeconomic policies softened the impact of external shocks.

Zambia is landlocked and resource rich like Botswana but has failed to manage resource rents in a growth-promoting way. Strikingly the gap in average investment rates between the two countries is not very wide (investment/GDP ratios of 20 percent in Zambia and 26 percent in Botswana), but the differences in growth rates and subsequently in the current per capita income levels are vast. (Ndulu et al 2007) Zambia is also one of the most peaceful countries in the region so the destruction of war does not explain the poor economic performance here.

Looking at the data from Blanke (2007) the reasons starts to unravel. Blanke (2007) uses the World Economic Forum's Global Competitiveness Index (GCI), a combination of survey data

from the forum's Executive Opinion Survey and quantitative data to evaluate African Economies on a number of factors that have already above been established as conducive to economic growth[19]. Competitiveness in this context is understood as the set of institutions, policies, and factors that drive productivity and therefore set the sustainable current and medium-term levels of economic prosperity. Improving the competitiveness of an economy in this sense is therefore the same daunting task as the quest for growth.

Looking at the indicators for the very basic drivers (Figure 2), we see that Zambia scores overall 3.52[20] (rank 116 of 128 countries), below the SSA average of 3.55 and far below Botswana (4.30, rank 82). The biggest differences between the two countries are in infrastructure and macroeconomic stability, but Zambia also falls behind in the other two indicators. Top three problems cited by survey respondents in 2007 were corruption, access to financing and inadequate infrastructure (The World Economic Forum 2007a). Improving access to credit and lowering its cost would be one of the urgent tasks, perceived as a major or very severe obstacle by about 85% of the respondents in a 2002 survey. For example, currently the typical value of collateral needed for a loan is 311%, much higher than the regional average of 149%. (The World Economic Forum 2007b)

The problems of another low performer, Ethiopia, look slightly different. While access to financing and inadequate infrastructure still occupy the top positions as most problematic factors for doing business (The World Economic Forum 2007a), the survey data reveals entrepreneurs see tax rates and tax administration as the major obstacles, with a much higher than average percentage of respondents naming these factors compared to rest of Africa or other low income countries. As a measure of the cumbersomeness of the tax administration, the average time an entrepreneur spends in meetings with tax officials is 7.32 days[21] vs. 2.99 days average of the region (The World Economic Forum 2007b). Other important focus points would be primary education and basic health care, as Ethiopia is falling behind the typical phase 1 economy in this

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[19] Public and private institutions, infrastructure, stable macroeconomy, health and primary education, higher education and training, market efficiency, technological readiness, business sophistication and innovation. See Appendix 3 for a more detailed explanation of the composition of the GCI

[20] on a scale of 1 to 7

[21] mandatory meetings and inspections with tax officials in the last two years

area as shown by the low primary enrollment rates (46.4%, rank 121), relatively high prevalence of tuberculosis, malaria and HIV/AIDS and high infant mortality rates. The health concerns are important for Zambia as well but the situation with basic education is, although far from perfect, much better (79.8% enrollment rate) (The World Economic Forum 2007a).

4.4.2 The Common in the Particular, the Particular in the Common

Each country has a unique situation and specific analysis of the constraints and biggest bottlenecks is always required. However, it is possible to learn from similarities between countries in similar stages of development and/or with similar resource endowments to point to a general strategic direction. Blanke (2007) argues that countries can be divided into stages of development with different major drivers of competitiveness and growth (Figure 2). This could reflect some of the likely shifts in focus and policy priorities a developing country will face over time. Once the productivity gains from filling the more basic requirements have been exploited the country will have to move onto the more sophisticated ones to continue to productivity and thus be able to sustain the higher wages and income. The concept is also integrated into the GCI by attributing different relative weights to the different drivers depending on the country's development phase (Table 7).

Weights (percent)	Basic requirements	Efficiency enhancers	Innovation and sophistication factors
Factor-driven stage	50	40	10
Efficiency-driven stage	40	50	10
Innovation-driven stage	30	40	30

Table 7: **Weights of Each Group of Competitiveness Drivers by Development Phase of the Economy.** Blanke (2007, 6)

With very few exceptions countries in SSA are classified as phase 1 countries, in the factor-driven phase. For the majority of the countries the binding constraints are thus likely to be found

in the general fields of institutional quality, infrastructure, macroeconomic stability and basic health care and primary education. Mauritius and South Africa have made it to phase 2 and should now look at problems to be solved in the realms of higher education and training, market efficiency and technological readiness. Botswana and Namibia, in transition between the two phases, are also likely to have similar challenges.

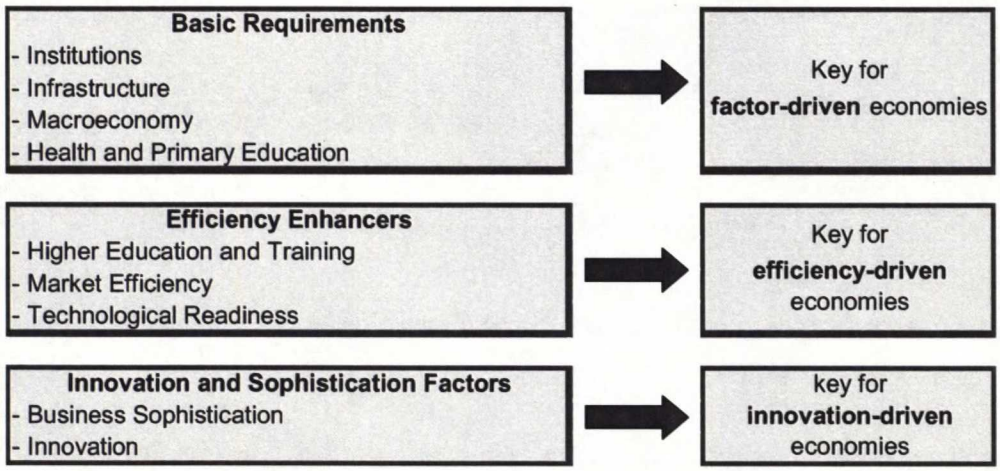

Figure 2: **Drivers of Competitiveness by Development Phase of the Economy.**
Blanke (2007, 6)

As late starters, African countries have a great opportunity to take advantage of its late starter status and leapfrog ahead in technological progress. However, they will need to get the basics right before it will be able to reap the fruits of investment in ICT and higher education and be able to succeed against the challenge of intense competition, especially from the Asian economies. Ndulu et al (2007) point out that the major competitive disadvantage at the moment relates to indirect costs private enterprise faces, largely related to deficiencies in infrastructure. The case of Botswana illustrates the need to keep working on the basics even when initial progress has been made as the future growth and human development in the country are jeopardized by the dire health situation. Especially HIV/AIDS is prevalent (37.3% for population aged 15 to 49, worst ranking out of all 128 countries) as are tuberculosis (553 incidents per 100,000 population, rank 116) and malaria (1245 cases per 100,000 population, rank 107) (The World Economic Forum 2007a).

Foreign aid is still needed to build up the physical infrastructure, particularly to overcome the challenges of landlocked African countries, which host 40% of the continent's population (Ndulu et al 2007). However, for sustained growth efforts of the public sector alone are unlikely to be sufficient. Public-private partnerships can ideally combine funding from both sectors with increased efficiency.

Improving efficiency of the private sector in the countries and building an attractive climate for private foreign direct investment should also be some of the key focus areas. In these areas the leadership of Africans themselves is vital to curb corruption, enhance transparency and ensure contract enforceability. The region needs to build up synergies to improve the overall reputation of the area, provide regional public goods and enjoy other spillover effects from the progress in neighboring countries; improving African competitiveness and growth rates is not a zero-sum game where one country's win is another's loss.

Even in the absence of a general consensus on a development agenda, general broad-based programs such as the Millennium Development Goals (MDG) are still prevalent. Such programs allow for little customization to take into account local realities and may waste resources in some cases if the reforms are not directed at the most binding constraints. Through second best effects it is also possible that some reforms might cause more harm than good. However, these broad common goals are not necessarily incompatible with the Diagnostics approach. A general sense of direction is needed, and easy-to-grasp, global programs are good for popular rhetoric and hence mobilization of important resources, both in terms of economic resources and political will. The MDG also focuses on many other aspects of development besides growth. This does not preclude a focus on improving the material well being in SSA through economic growth.

5 Concluding Remarks – Sub-Saharan Africa and Growth Diagnostics

Growth and other important issues in development are intrinsically intertwined. While many of these issues – income inequality, extreme poverty, low educational attainment and health problems – also contribute to keep growth low, poor countries need economic growth to be able to finance the solutions to these problems without relying to continued foreign aid. Reducing widespread poverty and reaching the Millennium Development Goals in SSA will require acceleration and sustaining higher economic growth.

Accumulation of physical and human capital, efficiency in the allocation of resources, technological progress and ensuring an equitable allocation of wealth are all important to sustained growth, but the policies and institutions required to achieve them vary depending on the initial conditions and change over time even in a given economy. The relatively low rate of capital accumulation and low TFP surely account for the lackluster growth SSA has shown in the past, but this will merely shift the discussion into the underlying causes of both and onto which policies should be employed to rectify the situation.

There seems to be little room for overarching big ideas in the post-Washington Consensus world. From growth regressions and growth accounting economists have been able to identify a range of proximate causes of slow growth, but the consensus only goes so far as to listing a number of very general conditions that are agreed to be growth promoting:

- Good institutions, rule of law, property rights,
- Market-oriented incentives.
- Adequate returns to investment, private appropriability of the returns
- Macroeconomic stability, sound monetary policies, sustainable public finance
- Social cohesion and political stability

However, such a laundry list is rarely helpful for a developing country. There is no agreement over the exact form good institutions should take, for example. It is difficult if not possible to change everything at once, given limited resources and political capital. Second-best conditions mean an ill-advised attempt at reform might leave the country worse off than before. A sense of priorities is therefore needed.

Practice has shown the dangers of using a single growth theory to derive uniform policy recommendations when the local realities are complex and vastly different from each other. Growth Diagnostics suggest a way to move from "cookie-cutter solutions" to customization by identifying case by case what are the most binding constraints to growth. It promises no panacea for solving the problems of the developing world but can be a helpful tool in getting from the proximate to ultimate causes of slow growth and low income levels in each specific case. These kind of exercises will ultimately be helpful in understanding the "African Dummy", which captures the region- or country-specific factors contributing to slow growth that are not captured by generalized regression functions.

In the post-Washington consensus world there is a strong need to avoid not only standardized solutions in highly divergent situations, but also attitude of "anything goes". Growth diagnostic may be a useful tool, giving analytical backbone to case studies. With its emphasis on the importance of localized knowledge this approach also encourages local participation, empowering Africa to be an active, equal partner in solving its own problems. Experiences of other countries with similar constraints to growth and/or in similar phases of development (especially the experiences of success stories in Asia) can help point out possibly successful strategic direction and sometimes unorthodox solutions, but careful analysis of the local conditions is of utmost importance to getting the priorities right.

Several positive developments in the past years have made the historically high growth rates in SSA possible: stronger demand for commodities (especially but not only oil), increased capital inflows and debt relief combined with success in the continued efforts to stabilize the economies and implement policy reform. Improved macroeconomic policies combined with decreased

political instability and conflict has helped to increase investment, strengthen growth and lessen income volatility.

Sustaining growth is even harder than initiating it. The binding constraint will change over time and new challenges need to be tackled along the way. Typically growth spurts in SSA have not lasted long and more often than not ended in collapse. The current turn of tide has the potential to last, as it is not totally depended on external factors such as terms of trade improvement. An IMF (2007) report notes that several sub-Saharan countries have sustained growth over many years despite facing stable or even declining terms of trade. However this is no time to let policies lax. The economies must be carefully monitored and resources from both the public and the private sector must be employed to their maximum potential to keep the momentum and continue to improve the material standard of living in the SSA.

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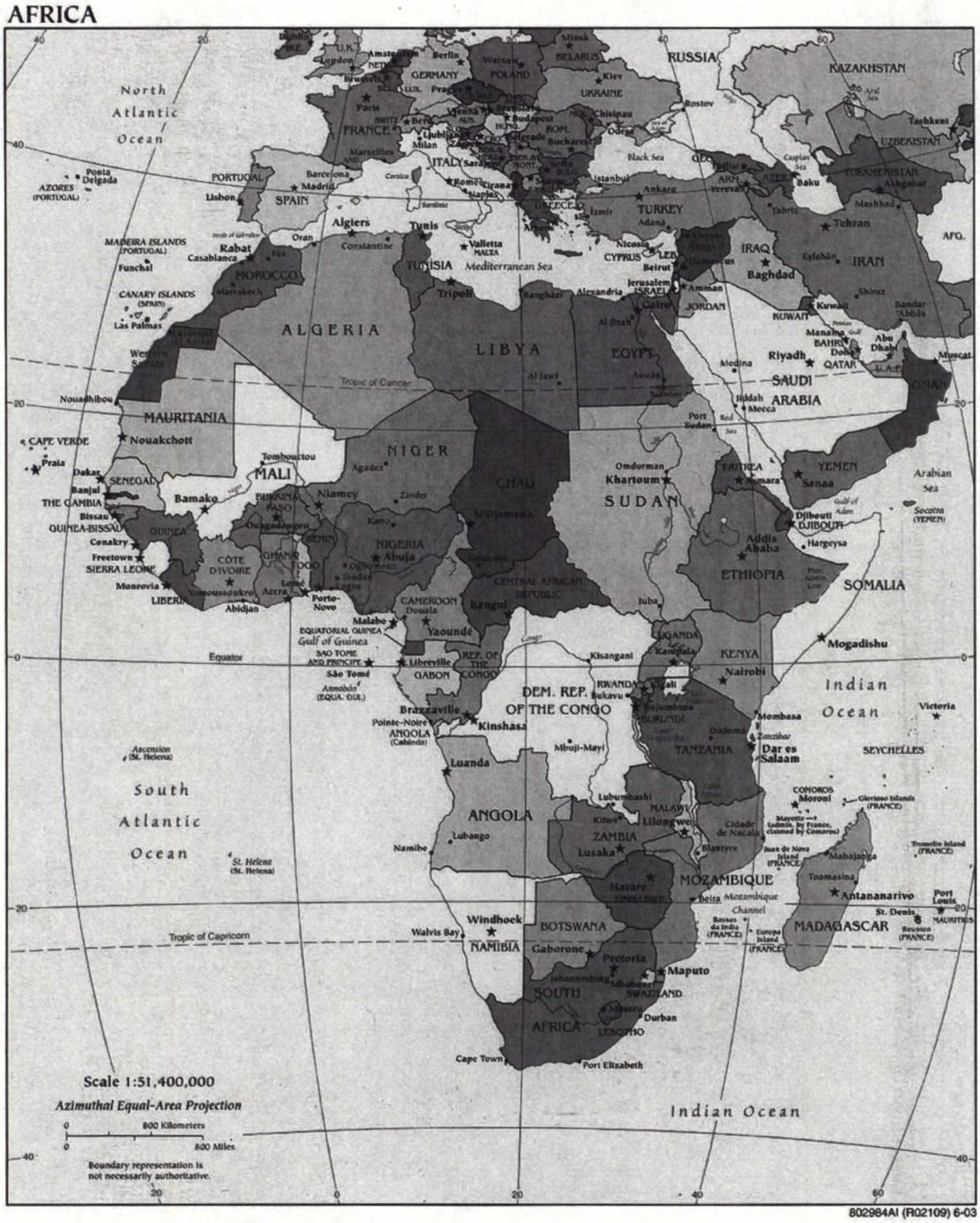
Appendices

Appendix 1: Categorization of Sub-Saharan African Countries. (IMF 2007).

Oil-Exporting Countries	Middle-Income Countries	Low-Income Countries	Fragile Countries
Angola	Botswana	Benin	Burundi
Camroon	Cape Verde	Burkina Faso	Central African Rep.
Chad	Lesotho	Ethiopia	Comoros
Republic of Congo	Mauritius	Ghana	Dem. Rep, of Congo
Equatorial Guinea	Namibia	Kenya	Côte d'Ivoire
Gabon	Seychelles	Madagascar	Eritrea
Nigeria	South Africa	Malawi	The Gambia
	Swaziland	Mali	Guinea
		Mozambique	Guinea-Bissau
		Niger	Liberia
		Rwanda	São Tomé and Principe
		Senegal	Sierra Leone
		Tanzania	Togo
		Uganda	Zimbabwe
		Zambia	

Appendix 2: Map of Africa
Source: http://www.lib.utexas.edu/maps/africa/africa_pol_2003.jpg



Appendix 3: Composition of the Global Competitiveness Index (Blanke 2007)

Survey data where not otherwise indicated

1st Pillar: Institutions

A. Public Institutions

1. Property Rights
   - Property Rights
2. Ethics and Corruption
   - Diversion of public funds
   - Public trust of politicians
3. Undue Influence
   - Judicial independence
   - Favoritism in decisions of government officials
4. Government inefficiency (red tape, bureaucracy, and waste)
   - Government spending
   - Burden of government regulation
5. Security
   - Business costs of terrorism
   - Reliability of police services
   - Business costs of crime and violence
   - Organized crime

B. Private Institutions

1. Corporate Ethics
   - Ethical behavior of firms
2. Accountability
   - Efficacy of corporate boards
   - Protection of minority shareholders' interests
   - Strength of auditing and accounting standards

2nd Pillar: Infrastructure

- Quality of overall infrastructure
- Quality of overall railroad infrastructure
- Quality of port infrastructure
- Quality of air transport infrastructure
- Quality of electricity supply
- Telephone lines (hard data)

3rd Pillar: Macroeconomy

- Government balance (hard data)
- National savings rate (hard data)
- Inflation (hard data)
- Interest rate spread (hard data)
- Government debt (hard data)
- Real effective exchange rate (hard data)

4th Pillar: Health and primary education

A. Health

- Business impact of malaria
- Business impact of tuberculosis
- Business impact of HIV/AIDS
- Infant mortality (hard data)
- Life expectancy (hard data)
- Tuberculosis incidence (hard data)
- Malaria incidence (hard data)
- HIV prevalence (hard data)

B. Primary education

- Primary enrollment (hard data)

5th Pillar: Higher education and training

A. Quantity of education

- Secondary enrollment ratio (hard data)
- Tertiary enrollment ratio (hard data)

B. Quality of education

- Quality of the educational system
- Quality of math and science education
- Quality of management schools

C. On-the-job training

- Local availability of specialized research and training services
- Extent of staff training

6th Pillar: Market efficiency

A. Good markets: distortions, competition and size

1. Distortions
   - Agricultural policy costs
   - Efficiency of legal framework
   - Extent and effect of taxation
   - Number of procedures required to start a business (hard data)
   - Time required to start a business (hard data)
2. Competition
   - Intensity of local competition
   - Effectiveness of antitrust policy
   - Imports (hard data)
   - Prevalence of trade barriers

3. Size
   GDP – exports + imports (hard data)
   Exports (hard data)

B. Labor markets: Flexibility and efficiency

1. Flexibility
   Hiring and firing practices
   Flexibility of wage determination
   Cooperation in labor/employer relations
2. Efficiency
   Reliance on professional management
   Pay and productivity
   Brain drain
   Private sector employment of women

C. Financial markets: sophistication and openness

Financial market sophistication
Ease of access to loans
Venture capital availability
Soundness of banks
Local equity market access

7th Pillar: Technological readiness

Technological readiness
Firm-level technology absorption
Laws relating to ICT
FDI and technology transfer
Mobile telephone subscribers (hard data)
Internet users (hard data)
Personal computers (hard data)

8th Pillar: Business sophistication

A. Networks and supporting industries

Local supplier quantity
Local supplier quality

B. Sophistication of firms' operations and strategy

Production process sophistication
Extent of marketing
Control of international distribution
Willingness to delegate authority
Nature of competitive advantage
Value chain presence

9th Pillar: Innovation

Quality of scientific research institutions
Company spending on research and development
University/industry research collaboration
Government procurement of advanced technology products
Availability of scientists and engineers
Utility patents (hard data)
Intellectual property protection
Capacity for innovation